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ABSTRACT

The review focuses on the issues surrounding the use of competency based teacher education (CBTE) by special education teachers. An introductory chapter covers a definition of CBTE, historical background of CBTE, competency based teacher certification, and research in teacher education. A second chapter provides a review of teacher behavior research with sections on position and review papers, empirical studies, methodological considerations, and tabular summaries of research. Given in Chapter III are tabular and narrative summaries of 18 selected CBTE programs in special education. Among conclusions based on the program review is that the programs reflected variety and commonality in structure, substance, and emphasis. The final two chapters offer guidelines and suggestions for CBTE program development and revision, and improved research in teaching. (SBH)

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COMPTENCY-BASED TEACHER EDUCATION IN SPECIAL EDUCATION:
A REVIEW OF RESEARCH AND TRAINING PROGRAMS

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CHAPTER I

COMPETENCY-BASED TEACHER EDUCATION

Educational innovations arrive and depart with predictable regularity. Some impact on ways of thinking, change and improve the process by which teaching and learning take place, and then are absorbed into the status quo. Ultimately, these innovations are supplanted by other innovations and new approaches. It is difficult to estimate how many false leads and fads are advanced for every innovation that proves useful. Each educator necessarily develops methods of reading the cues and data that suggest the imminence of a new direction. Responses are conditioned, as with other psychological and intellectual phenomena, by a multitude of factors. Experience with previous educational innovation accounts for much of the educator's responsiveness or resistance to new ideas. Failure to adopt an innovation may be based upon an unwillingness to take risks, largely a function of risk-taking in the past which produced undesired consequences. The continual generation and promulgation of new ideas in education--some of which are fads, others genuine improvements, and still others either premature or past all usefulness--must necessarily make the responsible educator wary. Missing the boat may not have consequences as great as commitment to one that will not float!

Is Competency-Based Teacher Education (CBTE) a fad, or is it an innovation to be seriously considered, evaluated, and given a fair trial? If legislative action, training program change, and quantity of literature produced in a relatively short period of time are indices of impact, then CBTE must be counted as an important contemporary educational formulation.

Because CBTE's appearance on the educational scene is a relatively recent occurrence, evidence concerning its promise as an educational practice is still not complete. It remains to be seen whether the practice of CBTE actually follows the theory and constructs that produced it. The hallmark of CBTE is public, operational definition of goals and performance criteria, but definitions and terminology used in CBTE programs are by no means universal or common to all practitioners. These ambiguities may well be intrinsic to CBTE, or they may be due to the recency of work in CBTE program development.

Of most interest to special educators, however, are the questions: What does CBTE have to offer to improve the education and habilitation of handicapped children? What is the status of CBTE in special education? Have special educators "missed the boat," or are they judiciously awaiting evidence that CBTE works? How can special educators make assessments regarding: (a) whether CBTE is an educational innovation worthy of active consideration? (b) what is the status of research evidence and does it uphold or negate the CBTE formulation? (c) which programs in special education are CBTE and by what criteria do they qualify? (d) what are the commonalities and differences between CBTE programs? (e) what conclusions may be drawn about what CBTE can offer special education teacher education programs? and (f) what additional research and development are needed to answer questions raised by the CBTE formulation?

The present review is an attempt to answer each of these questions, although some in greater detail than others. It is intended that this review focus discussion about specific issues in the preparation of teachers of handicapped children. Its ultimate objective is to uncover those problems in personnel preparation which are in need of further research.

What is CBTE?

According to Elam (1971), a competency-based program is one in which performance goals for trainees are specified in rigorous detail and agreed to in advance of instruction. The teacher or teacher trainee is required to (a) demonstrate behaviors known to promote desirable learning and/or (b) demonstrate that s/he can bring about learning in pupils. The emphasis is on demonstrated products or outputs. This definition, which appeared in the first publication of the American Association of Colleges for Teacher Education (AACTE), Committee on Performance-Based Teacher Education, is the most frequently cited of all definitions in the CBTE literature. The essential elements of a CBTE program include the following.

1. Knowledge, skills, and behaviors demonstrated by a trainee are derived from an explicit conception of the teacher's role, stated such that a trainee's behavior in relation to specific competencies can be assessed and made public in advance.
2. Criteria employed in assessing competencies are based on specified behavioral indicators and explicit levels of mastery, under specified conditions, and made public in advance.
3. Assessment of a trainee's competency employs performance as the primary source of evidence.
4. The trainee's progress through a program is determined by demonstrated competency, rather than by time or course completion (Elam, 1971).

The term Competency-Based Teacher Education (CBTE) has been used interchangeably with the term Performanced-Based Teacher Education (PBTE). The former term is used in this review because CBTE implies a more general concept than that of performance. The AACTE Committee adopted the term "performance-based" but indicated that the adjective is relatively unimportant as long as there is consensus on what elements are essential to distinguish performance-or competency-based programs from other types of training (Elam, 1971, p. 6).

Public statement of program objectives. Whatever term is applied, the common critical features of CBTE are publicly stated specifications of the teacher's role and an evaluation of the teacher's (or trainee's) competence based on performance. The implications of these simple propositions for teacher education programs are considerable. At the outset, CBTE requires that the assumptions governing the development of a training program be closely examined, that definitions be established, and that conclusions about the goals of the program be operationalized and "stated publicly" in advance. Whatever the future may hold for CBTE, it is probable that the notion of explicit, publicly stated of goals and specification of operations will endure as useful educational practices. As with any innovation, the practice of specifying and operationalizing the goals and objectives of education can be abused. The cynic's response to CBTE often relates to the facile rewriting in behavioral terms of existing curricula and training syllabi. Mechanical application of systems analysis terminology may result in a product that takes the form of a CBTE program but in no way reflects its substance. Thus, critics of CBTE often reject the entire concept, when, in fact, their objections may relate to inadequacies of implementation rather than the practice itself.

Evaluation of trainee performance. Trainee evaluation through performance is the second major facet of CBTE. Most programs make a distinction between the trainee's acquisition of knowledge about teaching and the trainee's acquisition of interactive teaching skills. In this, CBTE programs closely parallel traditional preparation programs. Yet one finds that many programs purportedly competency-based also use the term "performance" to refer to mastery or criterion-referenced testing. Although the trainee has the opportunity to retake a criterion-referenced test to demonstrate mastery over content, not much else distinguishes this practice from traditional course offerings which terminate in a grade for assignments completed and knowledge gained. Certainly this is "performance" in its broadest sense. In CBTE terms however, performance is the active demonstration of teaching skills--the "doing" of teaching as distinct from "knowing" about teaching. It is in the performance of *interactive* instructional skills that CBTE programs differ critically from traditional preparatory programs. The crux of CBTE training is the specification and measurement of teacher performance during the *act* of teaching. However, the specification and evaluation of interactive teaching skills are both technically and administratively difficult. Much program development in interactive instructional skills is required for a true CBTE program, but specification of necessary interactive skills is not likely to emerge from information available through previous research (Heath & Nielson, 1974). An ongoing commitment to deal with specification of instructional skills and evaluation of performance is required if CBTE is to fulfill its promise. Technical innovation in measurement is particularly vital in this facet of CBTE.

Modularization of instruction. The concept of the "module" as the unit of instruction is also an important feature of CBTE programs. An instructional module or training package is a unit of instruction which may be formatted in any number of ways (see Thiagarajan, Semmel, & Semmel, 1974) and contains instructional/behavioral objectives, information on resources for obtaining information, and criterion-referenced tests. Modules are most often self-instructional and require mastery rather than a given time period for completion. Some CBTE programs, such as those at Weber State and the University of Toledo, are entirely modularized; most preparation programs, however, incorporate modular components rather than depend upon them exclusively. Inherent in the construction of a module is a set of measures which assesses the trainee's mastery of terminal objectives. Evaluation measures are thus "built into" the module, thereby creating an ideal basis for research on the effects of instruction. Where performance tasks are built into the modular unit, as, for example, in Special Education Placement (Korba, Cawley, & Papinikou, 1972), Curriculum Consultants for Exceptional Children (Meyen, Altman, & Chandler, 1972), Clinical Teacher Program (Schwartz & Oseroff, 1972), and Behavior Modification Techniques for Teachers of the Developmentally Young (Anderson, Hodson, Jones, et al., 1972), then successful completion of the given tasks is assumed to be evidence of performance competence. It is important to keep in mind that modules vary greatly in the settings for conducting the performance tasks, and that successful performance in a laboratory setting or a simulated setting is quite different from performance in the natural setting (Turner, 1972).

Consortium for teacher education. Many CBTE models require inter-institutional consortia in training teachers. The notion is that a cooperative effort among local education agencies (LEA's) and training institutions is needed in both the specification of objectives and the provision of real school settings for training and performance evaluation of teachers. For this stipulation of CBTE, a wide discrepancy exists between objective and practice. In order for a teacher apprenticeship to take place--an apprenticeship under the guidance of a training program responsible for specification of goals and objectives--the relationship between the LEA's and training institutions must become one of increased cooperation. But, given the nature of institutional change, this is not likely to occur unless strong measures are taken. The frequent discrepancy between the ideal (consortium, in its most literal sense) and reality (fundamental institutional differences between university and local education agency) is a continuous source of criticism of CBTE programs. The resolution of this problem depends as much upon legislative and administrative changes as upon the nature of program implementation. In some states where CBTE programs have been mandated (e.g., New York, Michigan, Vermont), participation by consortium in program development and implementation has been required, but it is too early to determine the extent and effectiveness of governance by consortium.

Historical Background of the CBTE Movement

Over the past five or six years, the term Competency- or Performance-Based Teacher Education has been gradually introduced into the consciousness of teacher educators in the United States. Its reception as an educational innovation has been controversial; the connotative meaning of the term has been subject to vagaries of interpretation by both partisans and critics. The roots of the educational movement associated with these terms can be traced to several recent social, educational, political, and technological developments, each of which has been extensively discussed elsewhere (Hamilton, 1973; Lindsey, 1973; Silberman, 1970). It is interesting to note that so comparatively recent a development has generated such extensive literature in so short a period of time. Several bibliographies on CBTE are available (AACTE, 1971; AACTE, 1972; Cohen, 1973; Kay, 1973; Teacher Education Memoranda, 1972-73) as well as numerous technical manuals on CBTE program development and collected papers from symposia and policy studies (Arends, Masla, & Weber, 1971; Burns & Klingstedt, 1973; Houston, 1974; Houston & Howsam, 1972; Joyce, 1971; Multi-State Consortium on PBTE, n.d.; Rosner, 1972).

Precursors of the CBTE movement. In the late 1960's, the rising costs of public education coincided with mounting dissatisfaction by those concerned with the educational status of economically disadvantaged racial and ethnic minorities (Clark, 1965; Coleman et al., 1966; White, 1973). The result was a demand for "accountability" by local education agencies, which, in turn, generated a demand for accountability by teacher training institutions (Lessinger, 1971). The notion of accountability, not unlike the notion of CBTE itself, rapidly became an educational catch-word and slogan, the meaning of which varied with each advocate or critic. One consequence of the demand for accountability was the emergence of performance contracting, a concept often used synonymously with accountability (Vergason, 1973). As a factor in the development of CBTE, the accountability demand meant that an educational institution, like corporate industry, was responsible for producing tangible goods (e.g., measurable pupil gain in reading) on a cost-effective basis. The accountability movement gave rise to such educational experiments as the voucher system (Jencks, 1970; Levin, 1973; Levin, 1974), performance contracting (Lessinger, 1971), and a drive to reform teacher certification (Andrews, 1971; Burdin & Reagan, 1971; Daniel, 1971).

The accountability movement had particular relevance to special education programs: the pressure for demonstrable pupil progress brought to bear upon LEA's by civil rights groups also gave rise to demands that LEA's document the educational efficacy of placing minority group pupils in special classes. The litigation in behalf of minority group pupils (Cohen & DeYoung, 1972; Ross, DeYoung, & Cohen, 1971; Weintraub, 1972) and the controversy concerning the justification for special class placement of minority group pupils were reflected in the professional literature of special education during the same time span (Dunn, 1968; Jones, 1973; Mercer, 1970).

Another educational trend which played a significant role in the development of the CBTE movement was the growing influence, in academic departments, of the field of educational technology, specifically the application of systems theory and systems analysis to the problems of instructional management (Banathy, 1964; Briggs, 1970; Davis, 1973; Hamreus, 1968; Kaufman, 1972). Those aspects of systems analysis which have had the most widespread acceptance and application in restructuring educational programs are task analysis and the restating of objectives in behavioral terms. The theory and practice underlying these concepts were developed independent of the CBTE movement but have largely been incorporated into it. Behavioral objectives in particular are integral features of all CBTE programs (Elam, 1971; Houston, 1972; Schmeider, 1973). Any definition of CBTE includes the requisite that goals and objectives be stated in behavioral terms (Elam, 1971; Houston & Howsam, 1972), and, in fact, the two notions of CBTE and behavioral objectives are often used interchangeably. Nevertheless, the existence of behaviorally stated objectives in a program should be regarded as a necessary but insufficient condition for a program to be considered competency-based.

Over the same time period, the application of systems analysis was also growing in importance in special education. The principles of task analysis and development of behavioral objectives and performance standards gained great momentum through the convergence of these techniques with those of applied behavior analysis and behavior modification principles (Krasner & Ullman, 1965; Lindsley, 1964; Quay, 1966) in the education and habilitation of children with emotional disorders and learning disabilities. Task analysis is integral to the development of programs based on principles of contingency management. Some of the earliest CBTE programs in special education are those associated with applied behavior analysis or other behavior modification techniques (Anderson, 1972; Greenwood, 1974; Hewett, 1968; Hops, 1975; McKenzie, 1969; Van Etten & Adamson, 1973).

The elementary teacher training models project. Probably the most influential of all the historical sources of the CBTE movement was the funding in 1968 of the elementary teacher education models by the U.S. Office of Education (Burdin & Lanzillotti, 1969; Clarke, 1969; Engbretson, 1969). Originally, nine universities were selected to develop comprehensive models of teacher education. The first models and reports were completed in 1968, and the programmatic developments growing out of these models have been of major consequence in shaping contemporary policy, funding patterns, and thinking in the field of teacher education.

In 1967, the USOE Bureau of Research issued a request for proposals (RFP) for the development of a comprehensive undergraduate and inservice teacher education program for elementary teachers. The RFP stipulated that the models incorporate behavioral objectives and a systems analysis approach, as well as other features now regarded as components of CBTE programs. Ten projects for model development were finally funded. There were aspects unique to each of the models subsequently developed, but important commonalities were discernible (Clarke, 1969; Monson, 1969). Similarities between the models included: a stress on individualization and self-pacing; a reliance on technology, videotape, and computer-based programs; an emphasis on performance criteria and definition of teacher tasks; fewer formal courses; more and earlier experiences with children; increased cooperation between university and public schools; and utilization of laboratory experiences, microteaching, and simulations.

The institutions funded to develop the models in Phase I (programs) and in Phase II (feasibility studies) were Florida State University (Sowards, 1968), University of Georgia (Johnson, Shearron, & Stauffer, 1968), University of Toledo (Dickson, 1968), University of Pittsburgh (Southworth, 1968), Columbia University (Joyce, 1968), Syracuse University (Hough, 1968), Northwest Regional Laboratory (Schalock, 1968), Michigan State University (Houston, 1968), University of Massachusetts (Allen & Cooper, 1968), and University of Wisconsin (DeVault, 1969). Engbretson (1969) summarized some 70 additional proposals received by the USOE prior to the final selection of these 10 programs for the Phase II feasibility study. Summaries and discussion of the models can be found in Joyce (1971) and Clarke (1969).

In the years since the initial development of the models, most institutions involved have continued program development along the lines set forward in the models. In some instances, project directors involved with the original model developments have continued to work on these programs at other institutions. More recently, CBTE Centers, which are a direct outgrowth of the models projects, have been funded by USOE and are active in the development and dissemination of CBTE.

Federal commitment to the sponsorship of CBTE programs has continued during the past five years. Programs emphasizing CBTE have been funded under the auspices of the National Center for the Improvement of Educational Systems (NICES), formerly the Bureau of Educational Personnel Development (BEPD), which was originally established by the ESEA Act of 1965. A summary of USOE commitments by program and expenditure from August, 1967, to January, 1973, can be found in Hamilton (1973, p. 12).

Centers of CBTE activity. Much of the federal investment in CBTE has centered on Teacher Corps Projects. The major dissemination and information exchange functions have been carried out under the leadership of the American Association of Colleges for Teacher Education, Committee on PBTE, and the Multi-State Consortium. These organizations have been active in convening national and regional conferences and in publishing and disseminating information, resources, and research concerning CBTE. A publications list of each of these organizations is included in the annotated bibliography of the present review.

With the recent decline in federal support for educational research, one might have expected the momentum of CBTE program development to diminish. This does not appear to have happened, although much impetus for CBTE activity is now emanating from State Education Agencies (SEA's). Federal support for Teacher Corps, with its commitment to competency-based education, is apparently secure and continuous. The AACTE committee on PBTE continues to play a leadership role in disseminating program innovations and stimulating professional involvement in CBTE. Consistent with the nature of its membership, the AACTE Committee on PBTE is oriented toward university and preservice training programs. The other major organization involved in CBTE, the Multi-State Consortium, is also active in the organization of professional meetings, publications, and other dissemination activities. Consistent with its SEA orientation, the Multi-State Consortium has focused mainly on issues of certification, on the problems and implementation of consortia, and on in-service training. Cooperative projects have also been undertaken by the two organizations, particularly in joint sponsorship of national and regional meetings.

Competency-Based Teacher Certification

Competency-based teacher education has major implications for the nature of teacher certification and the drive to structure the certification of teachers on the basis of performance rather than course units completed. Changes in state certification policy, both legislative and administrative, have been numerous over the last five years. Recent reviews by Roth (1972), Maurer (1973), and Schmeider (1974) present a varied picture of the degree of state involvement in CBTE. Maurer (1973) reported a survey of the states which indicated that by 1973, 19 states had competency-based certification systems, nine states had rejected competency-based certification, and the bulk of the remaining states intended to implement competency-based certification at some future date. Data returned from 37 state education agencies indicated that SEA's regarded the assessment of teacher competencies as the responsibility of teacher preparation institutions. Variations from state to state in the criteria for competency-based certification, as well as the rapid nature of changes in practice, make definitive summary statements on the status of competency-based certification impractical, since such statements are certain to be quickly outdated. The Profile of the States in Competency-Based Education (Schmeider, 1974) is the most recent tabulation of state competency-based education policies, development activities, key publications, and unique program features. Although Schmeider does not summarize the information reported in the Profile, an examination of the document shows the accelerating momentum of state competency-based education activities since the reports by Roth (1972) and Maurer (1973). All states are now reported to be at least "studying" the concept. Many states have reported extensive development activities in both teacher certification and in requirements for training institutions to establish CBTE teacher preparation programs.

Opposition to competency-based certification has arisen from two main sources: teacher unions and some teacher education institutions. Organized teacher groups, most notably the American Federation of Teachers (AFT), have voiced reservations about CBTE (Bhaerman, 1974; Feldman, 1972; Shanker, 1973). Some teacher training institutions have also questioned the imposition of CBTE. For example, Sandoz (1974) recounted the reaction of a number of teacher training colleges and universities in Texas to the 1972 state standards mandating conversion of all preparation programs to CBTE. He likened the impact of standards requiring CBTE to the bombing of Pearl

Harbor. The organized opposition by colleges and universities in Texas led to challenges regarding the authority of the State Board of Education to mandate such standards. In an opinion rendered January 4, 1974, the State Attorney General ruled that it is not within the authority of the State Board of Education or the State Commissioner of Education to stipulate that institutions seeking approval for teacher education programs "must present performance-based applications, but the Board. . . may promulgate rules and regulations whereby institutions seeking such approval could choose between alternative plans. . ." (Walker, 1974, p. 4). The ruling, according to Walker (1974), did not concern the legality of performance-based teacher preparation, since it was concerned only with the limits of authority of the State Board of Education and the Texas State Commissioner of Education. Thus, the case does not appear to have wide ranging implications for other performance-based education programs. Rather, it appears to mean that--in this instance--legislation rather than administrative authority is required for mandating action on CBTE.

CEC professional guidelines and standards project. In 1972, the Council for Exceptional Children (CEC) initiated a project to update and revise its professional guidelines and standards. The concerns voiced in the preliminary reports of this project reflect the impact of CBTE since the last such project was completed in 1966.

In order to obtain basic data for the project, a preliminary survey was conducted in 1973 (Reynolds & Jenkins, 1973). A questionnaire was sent to special educators to obtain their predictions on what changes would occur in the field during the coming decade. Teacher education was the second most frequently predicted area of change--respondents expected a "more performance or competency-based orientation." The sixth most frequently predicted area of change was accountability. Respondents predicted "more explicit setting of goals and objectives in all programs. . .more emphasis on meaningful measurement. . .demands for cost data. . .more pressures for plans and accounting." In all, there were seven areas of expected change predicted by the 207 special educators who responded to the open-ended questionnaire.

A second part of the questionnaire asked respondents to indicate the importance of each of 30 topics to the professional guidelines and standards project. The statement "moving toward competency- or performance-based training and certification" received the highest rating from the greatest number of respondents (127 out of 207).

A Delphi survey was subsequently conducted which attempted to obtain an estimate from special educators of both the likelihood and the desirability of certain events occurring within the next decade (Reynolds, 1973). CBTE per se did not appear on either dimension in Round I of the survey, but the item "teacher rewards will depend upon performance, not time or credits" was one of five items showing the greatest perceived discrepancy between likelihood and desirability. The same results were obtained in Round II. Reynolds (1973) concluded the survey revealed that "special educators and their close colleagues wish to shift the emphasis to performance as the criterion for certification, rather than to settle for mere process criteria" (p. 47). There was also an indication of concern that certification be provided on a short-term basis and that performance criteria be applied in certification renewal.

Whether CBTE asserts a more direct influence on special education program planning in the future will, in some measure, be influenced by the final guidelines which emerge from the project. Indications from the preliminary project publication are that standards in special education will indeed be influenced by many of the tenets of CBTE.

Research in Teacher Education

The critical, innovative aspect of CBTE is the setting of performance standards for effective teaching. This implies that teacher educators either know or can demonstrate that a given behavior or constellation of behaviors, strategies, patterns, etc., results in desirable outcomes for pupils. The debate over CBTE centers on this issue. In the general educational research literature, several authorities (e.g., Heath & Nielson, 1974; Rosenshine & Furst, 1971) have taken the position, based on extensive reviews of teacher education research, that there is currently no sound empirical basis to support CBTE.

Since the measurement of "performance" depends on explicit performance goals, the CBTE model requires that performance objectives be made explicit at the outset. For this reason, one outcome of the USOE's elementary teacher training models project was the detailed listing of hundreds of teacher-performance criteria (Rosenshine & Furst, 1971). Rosenshine and Furst (1971) have criticized the model programs for their failure to specify how particular criteria were selected. Since the initial development of these teaching models, however, there has been a marked tendency to employ "expert appraisal" in the selection of performance criteria. Thus, in lieu of an unequivocal empirical data base, CBTE program developers have chosen to establish performance criteria on the basis of input and ratings by experts in the field. This input is usually accomplished by employing such survey methods as the Delphi Technique (Helmer, 1966), which has been used extensively for this purpose.

In special education, there are several notable examples of objectives for competency-based programs through surveys of expert opinion. Guidelines for the Training of Special Education Teachers (Black, Kokaska, & Nelson, 1973), sponsored by the California State Department of Education, was developed through application of the Delphi Technique. These guidelines were prepared in fulfillment of a 1970 California State Law which stipulated changes in the criteria for obtaining teaching credentials. The SECTraC Project (Meyen, Altman, & Chandler, 1972), developed for the training of curriculum consultants, was initiated by a series of field-based empirical procedures and also included a Delphi Survey. (A detailed description of this latter program is found in Chapter III.)

The well-known series on competencies of teachers of handicapped children, prepared under the auspices of the U.S. Office of Education during the 1950's, was influential in shaping thinking about special education teacher preparation. Included in the series were surveys of the competencies, qualifications, and preparation of teachers of the blind (Mackie & Dunn, 1955), teachers of the mentally retarded (Mackie, Williams, & Dunn, 1957), teachers of children who are socially and emotionally disturbed (Mackie, Kvaraceus, & Williams, 1957) and teachers of crippled children and children with special health problems (Mackie, 1961).

In their review of teacher-performance research, Rosenshine & Furst (1971) focused on process-product studies, that is, studies of classroom processes obtained either from rating scales prepared by observers (high inference) or from observation system data (low inference). Five teacher behavior variables yielded the strongest relationships with measures of student achievement: clarity, variability, enthusiasm, task orientation and/or businesslike behavior, and student opportunity to learn. There were also six variables which showed less strong relationships: use of student ideas and/or teacher indirectness, use of criticism, use of structuring comments, use of multiple levels of discourse, probing, and perceived difficulty of the course. The relationships were positive for 10 of these 11 variables and negative for use of criticism. Rosenshine & Furst are tentative in their conclusions, but they suggest several methodological improvements to enhance the usefulness of future teacher-performance research. Implicit in their conclusion is the notion that better research will provide the basis for improved teacher preparation.

Heath and Nielson (1974), on the other hand, have rejected Rosenshine and Furst's limited findings on teacher behavior-pupil outcomes because of methodological weaknesses in the original studies selected by Rosenshine and Furst. Heath and Nielson (1974) have concluded that teacher education programs, based upon research as presently conducted, will never provide an adequate empirical basis for CBTE:

> First, the research literature on the relation between teacher behavior and student achievement does not offer an empirical basis for the prescription of teacher-training objectives.
> Second, this literature fails to provide such a basis, not because of minor flaws in the statistical analyses, but because of sterile operational definitions of both teaching and achievement, and because of fundamentally weak research designs.
> Last, given the well-documented, strong association between student achievement and variables such as socioeconomic status and ethnic status, the effects of techniques of teaching on achievement (as these variables are defined in the PBTE research) are likely to be inherently trivial. (p. 18)

Heath & Nielson's argument on the absence of hard-data support for PBTE cannot be easily dismissed. However, their second conclusion that no strong data base currently exists due to "the sterile operational definitions of both teaching and achievement" seems to lend support to, rather than refute, the case for PBTE. With its emphasis on operational definitions explicitly stated in behavioral objective terms and derived from analyses of the educational task, CBTE would appear to be an ideal basis for research into concepts and behaviors that must be operationally defined if they are to be useful in research. A CBTE program should facilitate research through a greater commonality of objectives, terminology, and measurement strategies between and within training programs. Their final conclusion, which has been extensively debated elsewhere (Mosteller & Moynihan, 1972), has relevance to educational research and philosophy in general rather than to CBTE in particular.

Teacher education research and program evaluation studies. A distinction is made between (a) research evidence on the relationships between teacher behaviors and pupil outcomes and (b) research evidence on the effectiveness of a particular program or intervention in producing the desired goals. At this juncture, an important question must be considered: can research evidence which demonstrates specific relationships in the teaching environment (teacher behaviors and pupil outcomes) provide a valid base for CBTE program development? Some authorities assume that such research will, in time, provide the needed empirical base for developing a CBTE program (McDonald, 1974; Rosenshine, 1974; Rosenshine & Furst, 1971; Schalock, 1974). Others counter this argument (Bhaerman, 1974; Broudy, 1973; Heath & Nielson, 1974) by pointing out the lack of conclusive evidence regarding process-process or process-product relationships in over 50 years of research. Heath and Nielson (1974) summarize two basic arguments against the derivation of educational goals from empirical studies: First, the methodology of educational research has been inappropriately applied (i.e., statistical assumptions of data analysis have been violated in so many studies, that the corpus of sound research is quite small). Second, educational outcomes are the consequence of factors outside the control of educators (e.g., socioeconomic factors, pupil individual differences). These factors account for so much of the variance of pupil performance and pupil outcomes that the teacher effects uncovered through research are necessarily trival (Mood, 1970).

The debate over the appropriateness of deriving educational goals from empirical studies, although important, is not likely to be resolved in the near future. These uncertainties notwithstanding, the need to educate handicapped children and to train teachers to educate children remains a social imperative. Scientifically obtained data and assumptions derived either logically or empirically must undergird any educational innovation. It is our contention that the competency-based teacher education model can provide education researchers with the means for better pursuing the answers to pertinent empirical questions. It is futile to expect that an innovation such as CBTE will spring forth with an established empirical base and with evaluation data reifying the effectiveness of the program. What can be realistically expected is that the process of CBTE program development will generate the research necessary for a growing data base upon which to build subsequent programs.

Competency-based teacher education has great advantages as an applied model. Its implementation should result in the production of new empirical data upon which to base goal adjustments and other program modifications. Similarly, total program evaluation should produce data upon which needed adjustments can be made. Gage (1974) has suggested the use of factorial designs as a method for evaluating the component parts of a complex training program. Other useful evaluation methods can also be applied to this problem (Borich, 1972; Provus, 1971; Stake, 1967; Stufflebeam, 1971). What is most important is that, for research results to be meaningful and therefore useful in subsequent program modification, revision, and planning, the program itself must define and implement its precepts in a way that measurement--and hence evaluation--is possible at any point in the program. Given its specificity, then, the CBTE model can serve as the facilitator of an empirically oriented training program, even though its value in this regard has not yet been proven. Only through continued program implementation, attendant measurement, and evaluation can there develop some quantifiable basis for assertions about education and training.

In summary, we suggest that competency-based teacher education is a concept worth continued investigation because its salient features facilitate research and evaluation: educational goals must be empirically derived, made explicit, and publicly stated; training must be based on specific behavioral objectives derived from explicit goals; teacher trainee competence must be measured against a criterion of knowledge and ability to perform to criterion the skills required for teaching.

This chapter has, of course, stated the case for CBTE in ideal terms. The actual conditions required for realizing the research and evaluation potential of CBTE is the main concern of the present review. Selected research on teaching, teacher behavior, and selected special education CBTE programs is examined in subsequent chapters to determine whether this potential for data generation and feedback of empirical information for program modification and development is indeed reflected in current practice. It is anticipated that this review will generate a reasonable set of judgments about the needs and direction for future research and development geared toward improving the preparation of teachers of handicapped children.

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CHAPTER II

REVIEW OF TEACHER BEHAVIOR RESEARCH

Research on teaching has been the subject of a growing number of critical reviews, many of which are related to the models of elementary education discussed in the preceding chapter. Many reviews have been undertaken specifically because of the empirical requirements of CBTE programs (Dunkin & Biddle, 1974; Flanders, 1973; Gall, 1973; Heath & Nielson, 1974; Joyce, 1971; Peck & Tucker, 1973; Rosenshine, 1971; Rosenshine & Furst, 1971; Turner, 1975). These reviews address the specific issues of teacher-pupil behavior in the classroom setting, as well as the methodological issues involved in conducting research and reviews of research. However, there appears to be a lack of comparable review literature on teacher-pupil behavior research in special education.

The present review covers several topics in special education research which impinge upon the establishment of an empirical data base for CBTE program development. This review is a broad examination of related research rather than an indepth study of any single topic. This approach was adopted under the assumption that such a sampling of research on major issues in the field (e.g., teacher competencies, teacher performance, effectiveness criteria, pupil growth related to teaching) would indicate major trends, provide information on research strategies employed, and suggest directions for further research.

The review of research which comprises this chapter is presented in three major sections. The first section is a critical narrative summary of position papers and research reviews related to CBTE issues in special education. The second section is a summary and commentary on the studies reviewed, which are presented in tabular form in the last section.

The general education literature includes much discussion and controversy about competency-based teacher education, but only a few papers are specifically addressed to CBTE issues in special education. The reasons for this discrepancy between special and regular education may be due to differences in terminology rather than to substantive differences, to differential priorities, or to the fact that special education practitioners focus their efforts elsewhere. Nevertheless, there are some publications concerned specifically with special education CBTE issues (Adelman, 1973; Creamer & Gilmore, 1974; Shores, Cegelka, & Nelson, 1973; Stamm, 1974). In addition, there are a number of reviews of special education research that deal at least to some extent with CBTE-related issues (Blatt & Garfunkel, 1973; Guskin & Spicker, 1968; Jones, 1966, 1973; Semmel, 1975; Vergason, 1973).

Position and Review Papers

Before CBTE became a widely known educational innovation, Haring and Fargo (1969) discussed the preparation of teachers of emotionally disturbed children in terms which closely parallel the CBTE formulation. These authors placed particular emphasis on establishing program effectiveness criteria through measurement of the effects of teaching on children's behavior. They pointed out that explicit statements of behavioral objectives for each child are requisite to any procedure for measurement, that pupil performance can be "observed, counted, and analyzed," that changes in pupil behavior due to intervention can be measured, and that continuous, structured evaluation of teacher performance over time is the best measure of skill development. The precision teaching program developed at the University of Washington (Haring, 1968) was cited by Haring and Fargo as an example of a program in which evaluation of teaching performance is dependent upon measuring and recording pupil behavior and upon explicit statements of behavioral objectives for pupils.

In a review of several issues associated with CBTE in special education, Shores, Cegelka, and Nelson (1973) found that only a few programs actually produced competency statements to support their claims of operating a competency-based program. These authors located a number of published competency statements in the professional literature and found that all statements were based on expert opinion. Some programs had validated the competencies defined by experts against the judgments of practicing teachers (e.g., Bullock & Whelan, 1971; Dorwood, 1963; Mackie, Kvaraceus, & Williams, 1957; Meyen, Altman, & Chandler, 1971). Since this 1973 review, the generation and publication of competency statements in the field has proliferated (e.g., Black, Kokaska, & Nelson, 1973; Brolin & Thomas, 1972; Reynolds, 1973; Stamm, 1974; Strauch, 1974).

Shores, Cegelka, and Nelson also discussed the special education literature related to teacher personality variables and child behavior, direct observation of teachers, and problems of criterion measures. Concluding that "the specific effects of teacher behavior in the performance of handicapped children are largely unknown," they suggested that the most efficacious method of studying teacher behavior may be through direct observation of the teacher interacting in his or her classroom.

Stamm (1974) presented a general systems model for the design of competency-based special education professional preparation programs. This input-process-output or presage-process-product (P-P-P) paradigm was derived from Mitzel (1960). Stamm outlined the major attributes subsumed under the P-P-P paradigm and offered it as a guide to CBTE program development which covers all the relevant aspects of CBTE. Particular emphasis was placed on the need to obtain data on the outcomes of preparation programs which demonstrate the desired changes in pupil behavior. Stamm's paradigm for CBTE program development provides a broad conceptualization of preparation programs. The model also addresses the issues, procedures, and problems associated with the evaluation of teacher competencies.

Adelman (1973) developed a manual for special education training program development and implementation which covered a wide range of topics. This manual, titled Competency-Based Training in Education, presents a process model for planning, implementing, and evaluating teacher education programs. According to Adelman, "what is needed is not ad hoc itemizing of (competencies), but systematic conceptualizations and empirical investigations of what is required for successful performance of various school roles and functions with differing populations" (p. 25). He concluded that, although program evaluation is contingent upon a body of knowledge about relevant processes, criteria for program evaluation should be in items of "general contribution to educational services, training, and research, rather than in terms of such narrow criteria as pupil achievement in the (3 R's) or per capita costs with reference to immediate pupil benefits" (p. 158). This latter conclusion seems to imply that CBTE cannot get underway until all relevant behavioral data are available.

In the Second Handbook of Research on Teaching (Travers, 1973), Blatt and Garfunkel reviewed a wide range of research studies and problems related to teaching the mentally retarded. They reported a "dearth of research dealing specifically with variables of home and/or community," especially those studies bearing directly on social, emotional, and cognitive aspects of school behavior. No rationale was offered to explain the importance of such studies for improving teaching. Blatt and Garfunkel also noted that processes have received little attention in studies of children in school. They concluded that such studies have not been conducted because processes are less amenable to study than other variables.

In a parallel review for the Second Handbook of Research on Teaching (Travers, 1973), Hewett, and Blake reviewed research studies related to teaching the emotionally disturbed. They indicated that much published information on the topic is based on opinion and experience rather than research evidence. They cited the finding by Kounin, Friesen, and Norton (1966) that teachers' effectiveness in group management is a critical teaching skill for handling problem children in special or regular classes. Hewett and Blake concluded that managerial competence and sound academic teaching are very important in training programs for the emotionally disturbed. They also reiterated Glavin and Quay's (1969) suggestion that teachers should focus on immediate behavior problems and remediation of learning problems, rather than aim at "ambitious restructuring of personality."

In their review of research related to the education of the mentally retarded, Guskin and Spicker (1968) analyzed several studies investigating a number of educationally relevant variables (effects of preschool intervention programs, educational arrangements, etc.). Although their discussion of teacher effects centered on studies of expectancies (e.g., Rosenthal & Jacobson, 1968), they did note that "a great gap in research is in the area of teacher behavior" (p. 263).

Jones (1966) reviewed a series of studies addressing such input variables as experience with the handicapped, attitudes of prospective teachers of the handicapped, personality characteristics, and teacher perception of the prestige of special education. The studies reviewed were descriptive in nature, and the major dependent variables appeared to be the entry into and/or the retention of teachers in the field of exceptional children. Focusing on teacher characteristics may be useful in designing research studies aimed at developing predictors of teaching success, but such studies can be useful in teacher preparation programs only if criterion variables are adequately operationalized and investigated empirically.

Larsen (1975) summarized a series of empirical studies on the influence of teacher expectations and the phenomenon of the "self-fulfilling prophesy." Most of the studies reviewed dealt with regular classes. Larsen found that teacher's negative set or expectation was consistently related to teacher's perception and/or information about the child's ability. One of the major variables affecting teacher expectation was pupil sex--teachers expected girls to perform more favorably than boys. Teachers also evidenced lowered expectations of black pupils and children from low socio-economic classes.

Other CBTE-related papers. Vergason (1973) addressed the issue of accountability by comparing the program effectiveness of regular versus special class placement. He suggested that the voucher system may be a stimulus to improved education for exceptional children. He also maintained that the drive for accountability should result in a reexamination of the role of teacher expectancy, teacher planning, and the application of behavioral objectives, as well as the relationship of these variables to teacher education. According to Vergason, teacher use of behavioral objectives and standards for pupil performance should be standardized and made known to parents and other school personnel. Furthermore, workable accountability requires administrative support of teachers through consultative and other resource services.

In a paper addressing the application of systematic classroom observation to the study and modification of pupil-teacher interaction, Semmel (1975) suggested that little current evidence distinguishes the skills of "specially trained" teachers from those of regular teachers, or that the curricula and programs specifically developed for special education are actually the programs implemented in the special class. Semmel concluded that "if we wish to attribute pupil outcomes to a particular set of educational experiences, we must reliably describe these experiences through direct observation and recording *in situ*."

In their introduction to the published proceedings of a conference on the design of CBTE in special education, Creamer and Gilmore (1974) discussed the inconclusiveness of research on effective teaching and the lack of "developmental continuity" in this research. CBTE program development was seen as generating an "active professional concern with the potential gains to be accrued from the systematic study of teaching and its effect upon learning behavior" (p. 1). The papers presented at the conference provided useful CBTE program development descriptions, but they did not address the theoretical or empirical questions underlying the exigencies of program organization and implementation.

Observations on the review literature. This examination of the review and position papers on special education teacher preparation and research on teaching supports Creamer and Gilmore's observations regarding the present inconclusiveness of research on teaching. Assuming that the papers summarized in the preceding section are an adequate representation of the review literature, it appears appropriate to conclude that teacher education research is not as yet a topic of major interest to practitioners in the field. With few exceptions (e.g., Semmel, 1975; Shores, Cegelka, & Nelson, 1973; Stamm, 1974), teacher education research is regarded as but a tangential aspect of a general concern for the education of the handicapped child. For the most part, the review literature (e.g., Blatt & Garfunkel, 1973; Guskin & Spicker, 1968) documents questions on child placement alternatives, the merits of curricular approaches the social and psychological factors affecting the handicapped child, and diagnostic procedures.

Not only is there a paucity of literature in this area, but the literature which does exist does not reflect a clearly discernible focus of interest on a particular set of variables related to teaching and teacher education. The studies reviewed in this section dealt variously with empirically derived teacher competencies (Shores, Cegelka, & Nelson, 1973), classroom observation of teacher behavior (Semmel, 1975; Shores, Cegelka, & Nelson, 1973; Stamm, 1974), characteristics of special education teachers (Jones, 1966; Larsen, 1975), and accountability (Vergason, 1973). The special educator might expect to find greater evidence of discussion and debate in the special education literature on these and other major issues concerning teacher training and performance. Among the salient teacher education issues that could benefit from debate and critical review are the questions of (1) appropriate methodology and design for the conduct of teacher education research; (2) assessment of teacher performance by measurement of pupil achievement; (3) teacher behaviors amenable to modification; (4) appropriate teacher performance criteria and measurement of performance; and (5) the relationship between teacher knowledge and utilization of a particular curriculum and teaching skills.

Empirical Studies

This review assumes that behavioral research related to teaching is a necessary precondition for the sound development of teacher education programs. Two ancillary assumptions are that: (1) teacher preparation programs must bear a rational relationship to a given educational philosophy and to a set of goals derived from that philosophy and that (2) research into behavioral phenomena of teaching is necessary in order to align program goals and to modify program developments on the basis of current empirical evidence. Attention to both research methodology and research results are requisite areas of concern in teacher preparation programming. Therefore, the present review is addressed to these two interrelated areas.

Sources of research studies. The studies reviewed in this chapter were obtained from a variety of sources. An ERIC search was conducted which included, among others, the following descriptors: exceptional child research, teaching, teacher characteristics and performance, student behavior and classroom research. The journals of *Learning Disabilities*, *Special Education*, *American Journal of Mental Deficiency*, *Exceptional Children*, *Education and the Training of the Mentally Retarded*, *School Psychology*, *Volta Review*, and the *American Annals of the Deaf* were searched for studies on teaching and teachers conducted during the last ten years. A few studies completed prior to that time period were included because of their significance to current research. Other sources of information were U.S. government publications, reports by professional organizations, and recent project reports made available by the Bureau of Education for the Handicapped, U.S.O.E.

An attempt was made to obtain published studies and syntheses of studies of special education teacher characteristics related to teacher performance (e.g., the effects of motivation, attitudes, abilities). Of particular interest were studies related to competencies of special education teachers, teacher performance in the classroom, and effects of teachers and teaching upon the growth of handicapped children. These facets of research in teaching were examined in terms of the instructional setting in which teaching takes place, as well as in terms of the instructional content delivered by the teacher. Problems of methodology and research design in the study of teaching were also examined.

Organization of the review. Assessment of the extant research on teaching requires an organizational plan that logically relates the available research to competency-based teacher education program objectives. To accomplish this purpose, the model for the study of classroom teaching developed by Dunkin and Biddle (1974) was used to organize the empirical studies obtained. The model conceptualizes the relevant parameters of study as a series of relationships among (1) input or presage variables, (2) context variables, (3) process variables, and (4) product variables or outputs.

As indicated in Figure 1, the presage variables are comprised of teacher formative experiences, training experiences, and teacher characteristics (properties). The context variables are subdivided into pupil variables, including both pupil formative experiences and pupil characteristics, and into contextual variables concerning the school, community, and classroom setting. Process variables focus on observed pupil and teacher behaviors in the classroom. Product variables are divided into short-term and long-term effects of antecedent variables upon pupil growth.

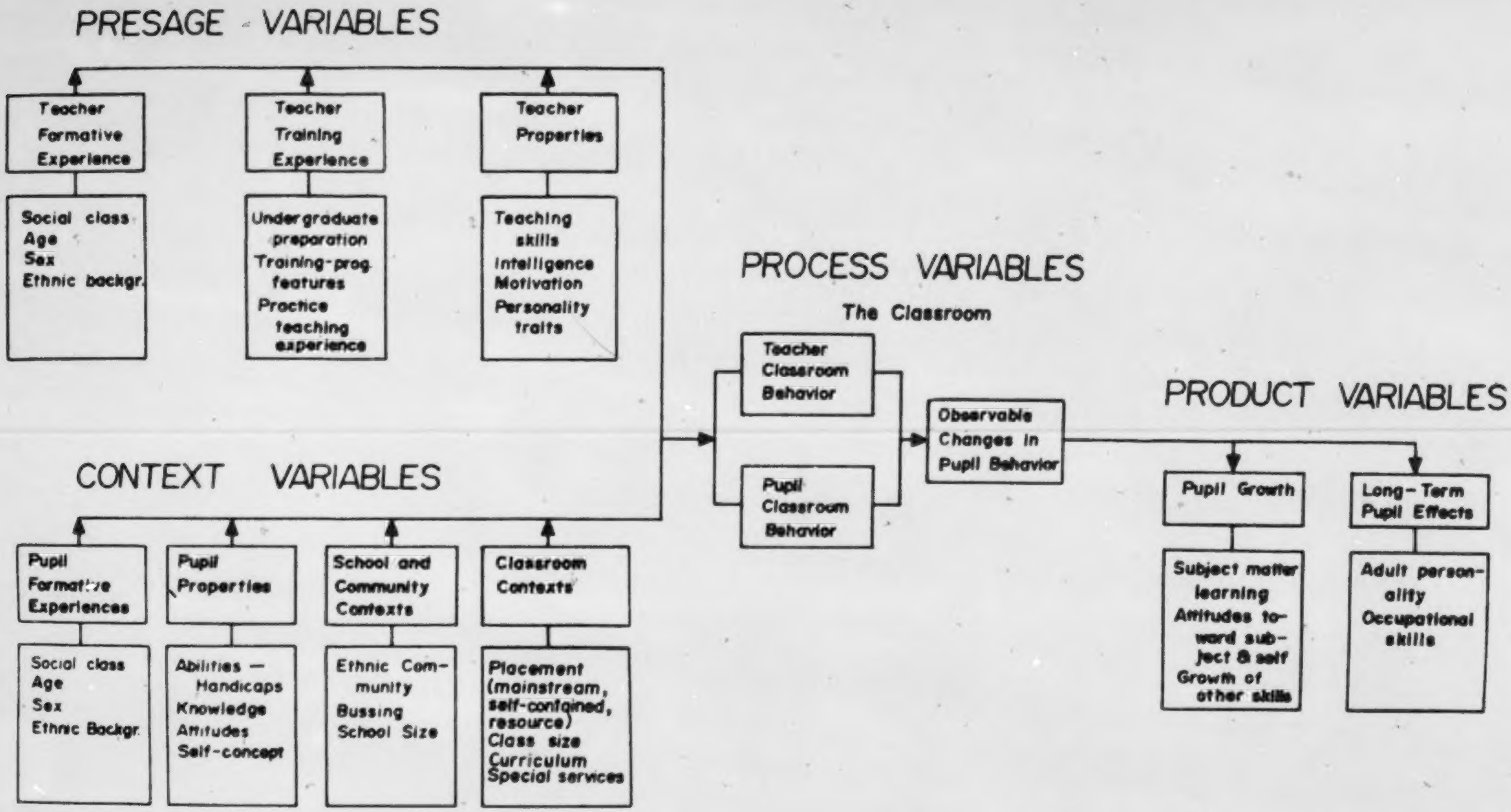
PRESAGE VARIABLES
Teacher Formative Experience
Social class
Age
Sex
Ethnic backgr.
Teacher Training Experience
Undergraduate preparation
Training-prog. features
Practice teaching experience
Teacher Properties
Teaching skills
Intelligence
Motivation
Personality traits
CONTEXT VARIABLES
Pupil Formative Experiences
Social class
Age
Sex
Ethnic Backgr.
Pupil Properties
Abilities — Handicaps
Knowledge
Attitudes
Self-concept
School and Community Contexts
Ethnic Community
Bussing
School Size
Classroom Contexts
Placement (mainstream, self-contained, resource)
Class size
Curriculum
Special services
PROCESS VARIABLES
The Classroom
Teacher Classroom Behavior
Pupil Classroom Behavior
Observable Changes in Pupil Behavior
PRODUCT VARIABLES
Pupil Growth
Subject matter learning
Attitudes toward subject & self
Growth of other skills
Long-Term Pupil Effects
Adult personality
Occupational skills

Figure 1. Model for the study of classroom teaching (after Dunkin & Biddle, 1974).

The relationships described by the model permit the classification of research into studies of relationships between presage-presage, presage-process, and presage-product variables. Descriptive studies of classroom processes are classified as "process occurrence" research. The balance of the process linkages are the process-process and process-product studies.

Purely descriptive presage studies or studies that relate sets of presage or context variables were not included in the review. Studies which deal with such variables as the status of trainee attitudes, abilities, and personality have relevance for personnel selection criteria, but they offer no information about trainee performance--the focal interest in the determination of competencies. Presage studies were included, however, in those instances where presage variables were employed to predict teacher behavior or performance, or where presage variables were used as baseline dependent variables for an intervention study (e.g., the effect of training program on trainee attitudes).

Tabular summaries of research. The studies of teacher behavior reviewed in this section are summarized in two sets of tables: Tables 1 to 6, Description and Tables 1A to 6A, Methodology and Outcomes. For both sets of tables, numerical designations correspond to the following classifications derived from the presage-process-product model: (1) presage-presage, (2) presage-process, (3) presage-product, (4) process occurrence, (5) process-process, and (6) process-product.

The set of tables labeled Tables 1 to 6, Description, lists the author(s) and year of each study, along with the independent and dependent variables of interest. In the case of process occurrence (descriptive) studies, the variables reported are summarized in a double column labeled "Observed Behaviors." Tabulated in the last two columns of this set of tables are the type and number of subjects used in the study and the name or type of instruments used to collect data. Reliability coefficients (if reported) are also indicated, with distinctions made between intercoder reliability or agreement (Ir) and coder agreement with criterion (Cr), and instrument reliability (r) (e.g., test-retest, split half, equivalent forms, etc). Reliability coefficients are not reported if the instruments used were standardized achievement or personality tests.

The first column in the set of tables labeled Table 1A to 6A, Methodology and Outcomes repeats the name of each study cited in Tables 1 to 6. The next column summarizes the design features of the study by utilizing Campbell and Stanley's (1963) descriptions of experimental and quasi-experimental designs for educational research. In the next column, the unit of observation or analysis (e.g., classes, teachers, pupils in classes) is indicated. The last column notes results, unusual features of the study, and supplementary information not covered in the other columns.

Summary of Empirical Studies

The studies on teachers and teaching behavior summarized in the tables (pp. 59-79) reveal a wide diversity of interests. For discussion purposes, the studies were classified according to the presage-process-product schema suggested by Dunkin and Biddle (1974). For the most part, this classification paradigm proved useful, but inconsistencies did appear in the application of the model due to differences inherent in simultaneously considering studies of "teachers" and studies of "teaching." The outcome or product variable of teaching studies is always pupil-related. In studies of "teachers," however, the independent variable may be a preparation program or other intervention, but the outcome or product variable is teacher-related. To this degree, the model was not entirely applicable as a vehicle for the classification of studies about teacher behavior. To account for this incompatibility, teacher behaviors were classified as presage or process variables, depending on the nature of the measurement of the dependent variable. When the outputs of a teacher training program were teacher attributes or properties, these were classified as presage variables. When such outcome data were obtained by observation or rating of teacher performance in the classroom, the outcome of teacher training was classified as teaching behavior and thus considered process variable.

Presage-Presage Studies

About half of all studies included in the review involved linkages with presage variables. Studies of presage-presage relationships focused mainly upon: (1) the effects of participation in a workshop or other course of study and (2) the relationship between teacher attributes or placement and teacher competencies or attitudes. There were too few studies on the effect of training to permit conclusions, but significant knowledge gains were reported in studies where the amount of teacher information about handicapped children was measured (Brooks & Bransford, 1971; Minskoff, 1972; Vitello, Sedlack, & Peck, 1972; Yates, 1973). Results of research on teacher attitude change as an outcome of training were inconsistent. In one case (Yates, 1973), teacher gain in information about the handicapped was accompanied by increased pessimism regarding the outcomes of integration.

While it is probable that a large proportion of special education training programs obtain pre-post evaluations of information gains, attitude change, self-assessment of competencies, etc., few studies or training outcomes are published in research journals. For example, several of the project reports which describe the special education CBTE programs analyzed in Chapter III contain such data (e.g., Courtnage, Brady, Suroski, & Schmid, n.d.; Deno, 1973; McKenzie, 1969; Sitko, 1975; Shea, 1974; Strauch, 1974; Sylves & Wolf, n.d.), but few of these projects have as yet published evaluation studies in a form suitable for research journals (i.e., in other than descriptive form).

A problem inherent in most studies of the effects of training is the generalizability of results, and the studies reviewed here were no exception. Each of these studies was conducted on a particular trainee population, with no evidence concerning the generalization of program effectiveness to other settings, geographic locations, or trainers other than the original program developers. Thus, data evaluating the effectiveness of the training programs may not be published in research journals due to the situation--specific conditions under which these studies were conducted. As a consequence, there is less dissemination of program information than of experimental studies, and thus program innovations are less subject to professional scrutiny than published research.

Descriptive studies. There have been a large number of investigations into the characteristics of special education teachers, particularly their attitudes and motivations for teaching the handicapped (Cawley, 1964; Gottfried & Jones, 1964; Heller, 1964; Jones & Gottfried, 1966; Jones, 1971; Rudloff, 1969; Semmel & Dickson, 1966; Willman, 1966). These studies of the characteristics of teachers or prospective teachers of the handicapped are descriptive in nature and therefore provide background information of potential use in program planning and trainee selection. The utility of these studies for CBTE is limited, however, due to the absence, in most cases, of criterion measures of teaching performance. Therefore, such descriptive or presage status studies were omitted from the present review.

Presage-Process Studies

The presage-process studies examined, concerned mainly the relationship between: (a) teacher or pupil variables, classroom settings, and/or training methods and (b) process and transactions in the classroom. Except for a study by Dobson (1972) which used a rating scale, all investigations employed low-inference observation systems to obtain data on classroom processes. The classroom interactions examined were of three types: (1) classroom climate variables employing the Flander Interaction Analysis System (IAS) or systems derived from Flanders (Craig & Holman, 1973; Fine, Allen, and Medvene, 1968; Schmitt, 1969; Stuck & Wyne, 1971; Weaver, 1969); (2) cognitive interaction systems (e.g., Aschner, Gallagher, Perry, Ofsar, Jenne, & Farr, 1965; Indiana Cognitive Demand Schedule (Lynch & Ames, 1972), or deviations from these scales (Lynch & Ames, 1972; Minskoff, 1967; Semmel, 1975), and (3) pupil task behavior and teacher management systems. Most of third type were developed for classroom observation of behavior modification techniques (Buckley & Walker, 1970; Cooper, Thomson, & Baer, 1970; Kounin, Friesen, & Norton, 1966;

Werry & Quay, 1969).

Unique in the presage-process group was a study of Ball (1972), which by assessed pupil perceptions of nonverbal teacher behaviors by means of videotape simulations. This unusually well-documented study showed that pupil race and race of teacher both played significant roles in EMR pupil's perceptions of nonverbal behavior, but that EMRs were not particularly astute in differentiating between types of teacher nonverbal behaviors.

Classroom settings. Craig and Holman (1973) compared open classrooms with traditional classrooms for deaf children and found that the percentage of pupil-initiated talk was higher in the open classroom, but the percentage of teacher-initiated talk was lower. Lynch and Ames (1972) compared regular and matched intermediate EMR classes and obtained large within-group differences on the levels of cognitive interchange. Differences were also obtained between regular and special classes--regular teachers spent more time interacting with pupils they rated as having high ability; special class teachers did not show a similar bias with EMR pupils. Employing Flanders' IAC, Stuck and Wyne (1971) found no significant differences when comparing verbal interactions in regular and special classes. Similarly, Fine, Allen, and Medvene (1968) found no overall differences between special classes and regular classes. However, EMR teachers did spend less time in extended talking, and there was more pupil-initiated pupil-to-pupil, pupil-to-teacher talk in special classes.

Behavior management. The studies of classroom management were primarily conducted by researchers interested in applied behavioral analysis. Buckley and Walker (1970) showed that, prior to intervention, 40% of the interaction between teacher and deviant pupil concerned inappropriate behavior. Werry and Quay (1969) found that "behavior problem children" awaiting placement in special classes were significantly different from normal children in the frequency of attention to work and the relative amount of positive teacher attention received. Kounin, Frieson, and Norton (1966), who obtained similar findings on the frequency of work involvement, also found that teachers' management played a significant role in the behavior of ED children. Teachers successful in managing non-ED children were also successful in reducing off-task behaviors in ED children.

Teacher training. Minskoff (1972) found no differences between a control group and teachers who received, in an experimental curriculum, training on the frequency of productive thinking and conclusion questions. Weaver (1969) increased frequency of teacher acceptance of student ideas by employing the Computer-Assisted Teacher Training System (CATTS), which provided instant feedback to teachers during teaching. Schmitt (1969) also employed CATTS to train teachers to increase their use of broad questions. In both cases, CATTS was instrumental in modifying teacher-trainee behavior. However, in the Schmitt (1969) study, the change in teacher behavior did not affect pupil responses.

Prediction of teacher behaviors. A number of studies attempted to predict successful teachers and/or teacher behavior from data on teachers or teacher trainee characteristics (Blackwell, 1972; Dobson, 1972; Meisgeier, 1965; Semmel, 1975). Prediction studies require the application of multivariate analysis procedures which are complex and require skillful statistical interpretation. Treatment of data would thus seem to be the major problem in such research, but an examination of these predictive studies suggests that their major weakness is an absence of adequate criterion measures for assessing successful teaching.

Presage-Product Studies

The focus of this group of studies was the relationship between teacher training or teacher characteristics (e.g., attitudes, expectancies) and pupil outcomes, (e.g., growth, improved self-concepts). Jones' (1974) study was the only one in this group which investigated the effects of pupil presage variables on pupil outcomes. Studies of the effects of teacher expectancies also fall under this classification and are subsequently discussed.

Of particular interest is Stowitschek and Hoffmeister's (1974) study on the effects of a math mini-course on pupil achievement. This investigation attempted the "acid test" for assessing the effects of teacher training--i.e., measurement of pupil outcome--and also gathered process data on experimental subjects. Effects of training were demonstrated by increases in the use of prompting and general praise by experimental teachers, as well as significant increases in achievement obtained by pupils taught by the experimental teachers. Stowitschek and Hoffmeister also reported the results of a questionnaire in which experimental and control teachers both estimated the average daily tutoring time during two periods: (1) the month preceding the study and (2) the last month of the study. The estimated mean time increase between these two periods was +12.93 minutes for the experimental and -4.50 for the control group. Although the results of mini-course participation were impressive, the difference between control and experimental teachers in the amount of time spent tutoring must be counted as an alternative explanation for the increases obtained.

The importance of amount of instructional time has been the subject of discussions by Winne (1973) and Harnischfeger and Wiley (1975). There is no question that the utility of teacher education research is severely limited by the absence of sufficient controls over and/or data about time as a facet of treatment. Stowitschek and Hoffmeister accounted for treatment time on a post hoc basis, but very few studies account for duration of treatment at all.

Labeling and expectancy studies. Studies on the effects of labeling and expectancies--presage studies which encompass both process and product relationships--have been the subject of much interest in special education research.

The social-psychological background variables associated with special classes for the handicapped or with mainstream placement of the special child, as well as the social-psychological phenomena of labeling and teacher expectancy, can be conceptualized as presage and/or contextual variables which influence the processes and outcomes of teacher-pupil interaction. Studies on the effects of labeling (Guskin, 1962; Jones, 1972; Meyerowitz, 1962; Mercer, 1970) have been used in arguments both for and against mainstreaming and other approaches to the mitigation of social consequences of labeling and segregation (Guskin, 1974; MacMillan, Jones, Aloia, 1974; Rowitz, 1974).

Teacher expectancy studies have also received considerable attention in both regular and special education. There appear to be two approaches to the study of expectancy effects on classroom interaction and pupil growth: (1) induced expectancies, in which false information about pupil potential is supplied to the teacher (Babad, 1971; Beez, 1968; Gozali & Meyen, 1970; Haskett, 1968; Rosenthal & Jacobson, 1968; Weaver, 1969); and (2) naturalistic studies, in which teachers are asked to rate pupil achievement, or in which pupils are classified according to available achievement data (Good, 1970; Haskett, 1968; Lynch & Ames, 1972; Willis, 1972).

A number of studies have supported the hypothesis that teachers in regular classes show a marked preference for interacting with high achievers or pupils who are perceived as high achievers (Brophy & Good, 1970; Good, 1970; Lynch & Ames, 1972; Rist, 1970). It is not clear whether the same preferential interaction pattern appears in the special class. Lynch & Ames (1972) found that regular class third grade teachers interacted more frequently with pupils they rated as high achievers, but a comparable group of intermediate EMR teachers did not show such biases in classroom interaction.

Haskett (1968) studied the expectancy hypothesis by supplying teachers of EMR children with accurate information about pupil achievement but false information about pupil social development scores. The study indicated that teachers' predictions about social and academic progress were significantly correlated with pupil achievement and social development. Haskett's results differed from those obtained in similar studies by Gozali and Meyen (1970) and Babad (1970). Neither of these investigations was able to show significant effects related to induced expectancies or pupil achievement.

Although the outcome of expectancies varies somewhat, both natural and experimentally induced expectancies have been shown to influence teacher behavior in enough instances to assert the validity of the phonomenon (Brophy & Good, 1974; Guskin, 1971). There are some aspects of teacher behavior related to expectancies that do warrant further investigation, however. Among these are questions about the nature of pupil data available to a teacher and the role of sources and amount of information available to determine teacher preferences. In addition, there are some indications from previous research (Jordan & Proctor, 1969; Semmel, Garrett, Semmel, & Wilcove, 1973; Yates, 1973) which suggest the need for a controlled study of the effects of teacher preparation on teacher expectancies. Studies that examine the operation of expectancies under natural classroom or training program conditions have the greatest potential utility. Continued study of experimentally manipulated teacher behavior cannot be expected to produce information on the operation of these same conditions in the normal school environment. In the case of expectancies, the mode of transmission of information to the teacher may be as potent a factor in consequent teacher behavior as the information itself.

Process Variables

The need to obtain objective information on what transpires in the classroom has been a major impetus for observational studies. There are several alternative methodological approaches to the study of behavior in the natural environment, but all are variants of two main lines of procedure: naturalistic, ecological approaches (Barker & Gump, 1964; Gump, 1969; Williams & Rausch, 1969) and observational category systems (Medley & Mitzel, 1963; Simon & Boyer, 1974). Two recent publications deal extensively with the methodology and application of observation systems for special education: Observation of pupils and teachers in mainstream and special education settings (Weinberg & Wood, 1975), and Observation systems and the special education teacher (Semmel & Thiagarajan, 1973).

Process Occurrence Studies

Process occurrence studies which are entirely descriptive, are distinguished from process-process studies in that no hypotheses are posited concerning causal relationships between processes. Nevertheless, these studies are rich sources of hypotheses about the nature of classroom interaction. Indeed, many of the process-process studies were the result of initial investigations which described the status of classroom interactions.

The various types of classroom behavior that have been reported in process occurrence studies are shown in Table 4 and Table 4A of the next section. Paris and Cairns' (1971) study is interesting in that the EMR pupils who were the subjects of classroom observation had initially participated in an experimental, laboratory study to determine the effectiveness of three different types of social reinforcers. In the experiment, which involved a discrimination task, pupil learning was found to be superior when negative evaluative comments were given. The study was followed by an examination of the natural learning environment in which these same children functioned. Observation data showed that positive teacher statements occurred frequently, indiscriminantly, and in a variety of functions, whereas negative teacher comments were infrequent and generally conveyed information.

Process-Process Studies

Almost all the studies dealing with process relationships investigated some aspect of pupil management (e.g., attention to task, work involvement, deviant behaviors). A number of these studies were conducted by researchers interested in behavior modification. In general, the research bears out the positive effects of reinforcement procedures in improving pupils' task behaviors (Brent, 1972; Hall et al., 1971; Hulten & Kunzelmann, 1969; Kazdin, 1973; Kazdin & Klock, 1973; Parsonson, Baer, & Baer, 1974; Walker & Buckley, 1970). The balance of the process-process studies concerned the effects of other specific teacher behaviors on pupil behaviors. Kounin & Obradovic (1968), in a study replicating Kounin, Friesen, and Norton (1966) were able to reproduce the earlier finding that teacher management effectiveness generalizes to all pupils, including ED pupils, in the regular class. They also obtained significant, positive correlations between teachers' "group alerting" and "accountability" behaviors, and ED childrens' work involvement in recitation settings, although these findings did not hold for seatwork settings.

Process-Product Studies

Only a few studies investigating observed classroom processes and their relationship to pupil outcomes were located. In Semmel, Sitko, and Kreider (1973), TMR pupils who showed greatest gains on the communication subscales of the Caine-Levine Social Scale were in classes taught by teachers who were observed to be less verbally restrictive and direct than teachers of low gain pupils. Hunter and Meyers (1972) found that teachers who manifested verbal acceptance and low rejection, but maintained classroom control, were more apt to have better pupil attendance, progress, and attitudes among children with learning problems. Dalton and Lynch (1974) compared the effects of teachers who asked pupils to draw from their own experience in responding to questions (episodic condition) and teachers who restricted pupil answers to specific lesson content (semantic condition). They found, not unexpectedly, that pupil verbal output was greater in the episodic condition than in the semantic condition. They also found that teachers gave more positive feedback to appropriate pupil responses during semantic questioning and that recall was significantly better under the semantic condition.

Methodological Considerations

Understanding classroom processes, classroom climate, and cognitive and management aspects of teacher-pupil interactions is critical in setting teacher competencies and performance criteria. There are, however, a number of difficulties associated with accurate collection of such data. These difficulties limit the conclusions that may be drawn from observational studies and, indeed, may play a role in the failure to obtain relationships between observed classroom interaction and pupil outcomes (McGaw, Wardrop, & Bunda, 1972). Extended discussions of the methodological problems associated with the collection of observational data can be found in Frick and Semmel (1974), Herbert and Attridge (1975), Johnson and Bolstad (1973), McGaw, Waldrop, and Bunda (1972), Medley and Mitzel (1963), and Rosenshine and Furst (1973).

Frick and Semmel (1974) suggested that one major source of error in observation studies is the failure to separate the statistically related but conceptually different measures of observer agreement and reliability of observational records. Adequate observer agreement required pretraining observers and conducting maintenance checks to assure that observers continue to code at levels achieved during initial training. Only a few of the process studies reviewed cited provision for maintenance testing of observers (Semmel, 1975).

Frick and Semmel also suggested that a comparison of coders' scores with a criterion measure would be a superior indication of reliability in terms of the objectives and definitions of the categories of observation. This assumes that the criterion measure is a precise reflection of the definitions of each category in the system. Such a criterion measure is best effected through the use of videotaped examples of the observational categories (Frick & Semmel, 1974; Medley & Norton, 1971). In the present review, only Ball (1971), Stowistchek and Hoffmeister (1974), and Semmel (1975) employed observer agreement with criterion measures as an indication of reliability.

The second area of concern is the collection of classroom process data related to the reliability or stability of the observed behavioral phenomena. There are major sources of error which result from setting or contextual differences between observations. These sources of error compound the unreliability of attempts to measure unstable behaviors and contribute to error in measuring stable behaviors (McGaw et al., 1972). Among the context variables that may influence the reliability of observation are differences in subject matter, class size, seating arrangements, group structure, nature of teacher pupil task, time of day, week, etc.

In the present review, only a few classroom interaction studies were found which reported any attempt to control for one or more of these sources of variation by specifying or limiting the conditions under which observational data were obtained. Among these studies were Werry and Quay (1969), which sampled only in individualized academic seatwork situations, and Craig and Collins (1970), which analyzed observational data in terms of three different setting variables (language dependent instruction, specialized instruction, and informal activities). The data in Semmel (1975) were all obtained during 30 minute tutorials set in the same laboratory setting. Similarly, the Stowistchek and Hoffmeister (1974) data were obtained from videotaped microteaching tutorials.

Research design. The design classification system used in column 1 of Tables 1A to 6A to describe teaching/teacher behavior studies was a modified version of the categorization scheme recommended by Campbell and Stanley (1963) for experimental and quasi-experimental designs and the categories recommended by Borg and Gall (1971, pp. 329-341) for correlational and nonexperimental designs.

Of all the studies reviewed, only six could be characterized as true experimental designs with control groups. The largest number of studies employed a time series paradigm (quasi-experimental) and reflected a behavior modification orientation in the way variables were manipulated. There were an equal number of causal-comparative and correlational prediction studies. Surveys, pre-experimental designs, and descriptions were the least frequent methodologies encountered.

In those studies which required randomization of selection and/or assignment of subjects to groups, only four studies reported the use of randomization procedures.

The unit of statistical analysis in approximately 30% of the studies reviewed was inappropriately designated as individual children and/or teachers in cases where subjects were exposed to treatment conditions as a group.

Data analyses varied considerably across studies; descriptive, nonparametric, and parametric options were equally represented. The several research designs encountered--surveys, descriptions, causal-comparative studies, correlational prediction studies, time series, and experimental designs--are considered in more detail below. Particular attention is given to randomization, documentation of treatment(s), assumptions of specific statistical analysis techniques, and generalizability. The trends identified both within and across design categories suggest a need to change many present practices and priorities in special educational research.

Randomization both in selection for and assignment to groups is always a problem for those engaged in field-based behavioral research. It is more expeditious to survey, describe, or "treat" intact groups. Control groups, if included, are often "assumed" to come from the same, representative, homogenized population as the experimental groups. Only a few of the studies reviewed used adequate randomization procedures (Gozali & Meyen, 1970; Greenwood, Hops, & Walker, 1975; Paris & Cairns, 1971; Stowitschek & Hoffmeister, 1974). Failure to consider randomization is reflected in all other studies, regardless of design. In surveys and descriptive analyses, this deficiency is of minimal concern since there is usually no intent to generalize characteristics to a larger population. This is particularly true of all but one of the process occurrence studies summarized in Table 4A, in which the emphasis is on documenting teaching events or observing behavioral correlates of teacher characteristics. Similar comments are applicable to the Hunter and Meyers (1972) and Vitello et al., (1972) surveys. Although randomization is not a precursor to time series paradigms, it is a requirement for all other options (i.e., experimental, causal-comparative, and correlational prediction designs) if variables are to be controlled adequately and if generalization is to be permitted. Even when presented with intact groups, investigations should attempt to incorporate some modified form of randomization, particularly in the experimental designs where group differences are intended to be the result of treatment differences. Several studies would have benefited from the use of randomization procedures (Dalton & Lynch, 1974; Schmitt, 1969; Shotel, Iano, & McGettigan, 1972; Weaver, 1969; Yates, 1973). In several causal comparative and correlational prediction designs dimensions of group differences are subject to charges of methodological error on several grounds (i.e., failure to document selection procedures, failure to select comparison groups from the same larger population, failure to obtain representative random samples from the appropriate population subgroups, and use of small sample groups) (Dobson, 1972; Fine, Allen, & Medvene, 1968; Lynch & Ames, 1972; Meisgeier, 1965; Scheuer, 1971; Semmel, 1975).

Documentation of treatments is also an obvious defect in most studies, particularly in long-range pretest/posttest designs. Only minimal attention is given to the documentation of control group activities concurrent with anv treatment activities. This paucity of information not only restricts the ability to initiate legitimate replications, but also does not permit sound interpretations of the interval validity of a study. The documentation of treatments in Ball (1972), Buckley and Walker (1970), Fargo (1967), Minskoff (1967), Schmitt (1969), Stowitschek and Hoffmeister (1974), Walker and Buckley (1974), and Weaver (1969) was comprehensive and useful, but these studies are definitely in the minority. Winne (1973) has suggested that, due to the limited space available for methodology in research journals, authors should be required to prepare comprehensive methodology sections for their prepared texts to accompany requests for reprints. Judging from this review, this suggesting has considerable merit.

It was not possible to evaluate in detail the extent to which causal-comparative, correlational-prediction, and experimental studies took into account the assumptions of specific parametric analyses. However, numerous errors in the unit of statistical analysis selected were noted. This basic infraction, when adjusted, would likely nullify the results of some studies because of the considerable reduction in group N's (i.e., Gozali & Meyen, 1970; Jones, 1974; Richmond & Dalton, 1973; Scheuer, 1971).

Time series designs reviewed employed the only descriptive data reduction procedures which did not involve the violation of assumptions about score distributions or variances, but, as a result, inferences about generalizability are not possible. However, most time series studies did control for most sources of internal invalidity except instrumentation and history.

The foregoing discussion suggests that the results of many of the studies reviewed can be questioned or discounted because of one or several methodological errors. Although some errors are common to all designs, others are more idiosyncratic: Conversely, some designs are stronger than others in terms of their control of extraneous variables.

Sampling, documentation of errors, and application of appropriate statistical analyses will be relatively easy to improve in future research efforts that focus on teaching and teacher behavior if researchers assume a higher level of experimental rigor. Not so easy to remedy will be the quality and value of future research efforts. Currently, there is a lack of continuity of research in teaching. Studies are idiosyncratic isolates in which the degree of commonality across studies is incidental or the result of a reviewer's ex post facto synthesis.

Empirical Basis for CBTE

The studies reviewed here present a fragmented picture of the effects of training and behavioral variables and thus prohibit a coherent statement about desirable teaching competencies or optimal environments. They give only marginal support to the teacher trainer's search for an empirical base for competencies and training procedures. As a result, teacher trainers have resorted to collecting "expert" judgment in the establishment of competencies and in the design of systems for program planning and revision. Selected training programs which have coped with these problems within the context of CBTE are documented in the next chapter.

TABULAR SUMMARIES OF RESEARCH

Table 1. Studies of Teacher Behavior: Description

Presage-Presage Studies

Study	Independent Variables	Dependent Variables	Subjects / N	Instrument/ Reliability
1. Brooks & Bransford, 1971	Participation in affective workshop.	Change in attitude toward 8 special ed. concepts.	10 administrators, 20 regular class teachers.	Semantic differential on 8 concepts; no reliability information.
2. Minskoff, 1972	Workshops on interpersonal skills, attitude toward minorities, & language instruction.	Self-rating on interpersonal skills, self acceptance, attitudes toward minorities, language teaching skills.	Preservice trainees, 3 experimental groups: Interp. N = 1 control group, 16.	Interpers. skill questionnaire, r.67 ; self-acceptance scale, r.74; attitude & value scale, r.76; linquistic rating scale, r.65 (all self-rating).
3. Shotel, Iano & McGettigan, 1972	Teachers in integrated resource room schools. Teachers in schools w/self-cont. special classes.	Teacher attitude toward integration of handicapped.	59 experimental, 55 control.	Attitude questionnaire; no reliability information.
4. Vittelo, Sedlak, & Peck, 1972	CAI course in early identification of handicapped children.	Teacher attitude toward course. Teacher self-report on ability to identify handicapped.	31 regular elementary teachers.	16 item questionnaire; no reliability information.
5. Yates, 1973	Continuing education program.	Teacher knowledge of special education. Teacher attitude toward integration.	40 regular grade, K-5 teachers.	Dogmatism scale critical thinking appraisal special education information.

OS = Observation System
RS = Rating Scale
r = Instrument Reliability
Ir = Coder Agreement
Cr = Agreement with Criterion

Table 1A. Studies of Teacher Behavior: Methodology and Outcomes

Presage-Presage Studies

Study	Design	Statistics	Unit of Analysis	Sig?	Results & Supplementary Information
1. Brooks & Bransford, 1971	0 x 0	T-test	30 workshop participants	3 of 8 hypoth.	Sig. positive change in att. toward special ed., prevention, & integration.
2. Minskoff, 1972	$0\ x_a\ 0$ * $0\ x_b\ 0$ $0\ x_c\ 0$ $0\ x_1\ 0$	Chi square	Trainee groups	On lang. skills only	Group in lang. workshops showed positive feelings about ability to teach. No difference between control group & other workshop groups.
3. Shotel, Iano, & McGettigan, 1972	0 x 0 $0\ x_1\ 0$	Chi square	Teachers	Yes	Teachers in resource room schools were less in favor of integration of MR by end of school year.
4. Vittelo, 1972	Survey	%'s	Teachers in course	Yes	Favorable to CAI course & utility in classroom.
5. Yates, 1973	0 x 0 $0\ x_1\ 0$	ANCOVA	Group	Yes	Sig. difference in amount of special ed. information & belief in integration of limited- & seizure-prone pupils obtained by experimental group.

*0 = Observation
x = Treatment
x_a, b, c, = Experimental
x_1 = Control

Table 2. Studies of Teacher Behavior: Description

Presage-Process Studies

Study	Independent Variables	Dependent Variables	Subjects / N	Instrument/ Reliability
1. Ball, 1972	Pupil SES, race.	Pupil perception of non-verbal behaviors.	84 jr. high EMR pupils.	Visual-Person Perception Test. Videotape examples of 7 Galloway OS categories; r=no diff. on test-retest validation by expert judges.
2. Blackwell, 1972	Teacher attitudes & personality.	Supervisor ratings of teacher effectiveness.	70 teachers of EMR.	Edwards Pers. Prof.; MTAI; personal data sheet; teacher compet. rating scale.
3. Buckley & Walker, 1970	Pupil placement in token economy classroom for two months.	Maintenance of attending behavior in regular class.	44 children exibiting deviant behavior. (normal IQ) 44 reg. class teachers of deviant children. 2 special class teachers.	Classroom observation system; Ir.80.
4. Cooper, Thomson, Baer, 1970	Training to modify teacher attention by providing feedback.	Teacher attention to appropriate child behavior.	2 headstart teachers.	Observation system; Ir.73 to 95.
5. Craig & Holmans, 1973	Open classroom, traditional classroom for deaf children.	Observed teacher-pupil classroom interaction.	3 teachers, 24 deaf children in school for deaf.	Craig Collins adaptation of Flanders. Pittsburg Rev.I.A., open classroom version; no rel. info.

Table 2. Studies of Teacher Behavior: Description

Presage-Process Studies (Cont.)

Study	Independent Variables	Dependent Variables	Subjects / N	Instrument/ Reliability
6. Dobson, 1972	Trainee psychological variables.	Ratings of observed trainee behavior.	28 student teachers in residential schools & classes for ED children.	Standardized personality tests. Biographical questionnaire Observer Rating Scale.*
7. Fine, Allen, & Medvene, 1968	Regular classes. Special classes.	Verbal interaction patterns.	4 upper elementary EMR, 4 reg. 5th & 6th grade classes, & 4 reg. grade 2nd & 3rd grade classes.	The Verbal Interaction Category System (Aimdon & Hunter); 94% agreement.
8. Kounin, Friesen, & Norton, 1966	ED pupils, non ED pupils.	Work involvement deviancy.	30 classrooms containing at least one ED pupil.	Videotapes of classroom observation system; Ir.92.
9. Lynch & Ames, 1972	a. Intermediate EMR classes, 3rd grade classes. b. Teacher rating of pupil ability.	a. Cognitive interaction. b. Frequency of interaction with high ability ratees.	10 EMR classes, 10 3rd grade classes.	Individual Cognitive Demand System (ICDS): Ir="adequate."
10. Meisgeier, 1965	Trainee psychological characteristics.	Cooperating teacher & supervisor ratings of successful student teaching.	41 student teachers of MR & physically handicapped.	7 standardized personality & ability tests. Personal information blank. Evaluation record for teachers of handicapped; r.82.
11. Minskoff, 1967	32 training sessions in experimental curriculum & inductive teaching.	Pupil productive thinking & conclusion questions.	9 experimental EMR classes, 8 control EMR classes, 17 teachers of EMR.	Gallagher-Aschner Classification System (O.S.); Ir.80.

*Reliability measured by congruence of 3 independent ratings.

Table 2. Studies of Teacher Behavior: Description

Presage-Process Studies (Cont.)

Study	Independent Variables	Dependent Variables	Subjects / N	Instrument/ Reliability
12. Schmitt, 1969	CATTS feedback (instant-visual). Subject matter areas: social studies & math.	Use of broad questions by teacher & broad responses by pupil (% of classroom interaction in these categories).	12 teacher trainees, 21 EMR boys.	Modified Flanders CATTS automated data collection; Ir.84 to .92.
13. Semmel, D. 1975	Trainee personality, experience, & ability.	Tutorial teaching.	23 special ed. preservice, trainees, 15 EMR pupils in lab class.	Cog-Man Obs. System Cr.79; standard personality & ability tests. Biographical questionnaire.
14. Stuck & Wyne, 1971	Intermediate EMR classes, primary & intermediate reg. classes.	Teacher-pupil verbal behavior.	9 intermed. EMR classes, 9 intermed. reg. classes, 9 primary reg. classes, 27 teachers.	Flanders IACS; Ir.84.
15. Weaver, 1969	Computer assisted training feedback (CATTS) induced expectancy.	Teacher acceptance & use of student ideas. Student initiated responses.	18 preservice trainees. 30 EMR pupils.	Modified Flanders IA CATTS data collection; Ir.83 to .88.
16. Werry & Quay, 1969	Normal children. Conduct problem children.	Observed deviant & attending behaviors.	3 groups of "conduct problem" children: N=11, N=12, N=11. 1 control group of normal children: N=10	Observation system; Ir.63 to .96.

Table 2A. Studies of Teacher Behavior: Methodology and Outcomes

Presage-Process Studies

Study	Design	Statistics	Unit of Analysis	Sig?	Results & Supplementary Information
1. Ball, 1972	x 0	ANOVA Regression Analysis	17 groups of 5Ss in each assignment stratified by race & SES	Yes	Race of Ss influenced perception of nonverbal behavior. EMRs did not differentiate teachers nonverbal behaviors. Race of teacher affected Ss responses.
2. Blackwell, 1972	Correlational Prediction Study	Multiple Regression Analysis	Teachers	Mixed	Teachers rated high likely to be women working at preschool level. No relation between competency & no. yrs. schooling or teacher experience.
3. Buckley & Walker, 1970	Time series-baseline, treatment, & maintenance	Rate and mean gain	Deviant pupil & teacher	Yes	40% teacher-dev. pupil interaction was on inappr. behav. Sig. increase in teacher attention to appropriate pupil behavior after treatment. Correlation of teacher-pupil behav. increased from treatment.
4. Cooper, Thomson, Baer, 1970	Time series-baseline, treatment, & maintenance	Rate	Teacher	Yes	Teachers showed increase in attending to appropriate child behavior after feedback training. Rates of attending to disruptive behavior unchanged.
5. Craig & Holmans, 1973	0 x 0 0 x_1 0	%'s	Pupil & teacher	No	% of teacher initiation low; % of pupil initiated-productive categories higher in open classroom.
6. Dobson, 1972	Correlational Prediction Study	High-low score comp., regression analysis, chi square	Student teachers	50 of 70 predictions	Biograph. data best predictor of warmth, enthusiam, & organization. Creativity scale predicted classroom creativity. Personal. adjusting coping abil. neg. corr. with observed behav.

*Ss may have been entire jr. high pop. in school district.

Table 2A. Studies of Teacher Behavior: Methodology and Outcomes

Presage-Process Studies (Cont.)

Study	Design	Statistics	Unit of Analysis	Sig?	Results & Supplementary Information
7. Fine, Allen, & Medvene, 1968	Causal comparative	R.O. correlation	Classes	Mixed	Overall patterns same for both groups, but EMR teachers spent less time in extended talking. More pupil initiation in EMR classes.
8. Kounin, Friesen, & Norton, 1966	Causal comparative	Spearman r t-test	1 ED & 2 to 8 non-ED children in each class.	Yes	ED children showed less school appro. behavior than non-ED. Teachers successful in managing non-ED also successful with ED children. "Withitness" & program variety corr. with pupil behavior.
9. Lynch & Ames, 1972	Causal comparative Ss randomized	Mean frequencies, ANOVA	Classes	a.No b.Yes	a. Large within group diff. on % instruct. time in read., rate of cog. interchange demand level, information feedback. b. Reg. 3rd grade teachers had more cog. interchange w/pupils judged high achievers. Special class teachers did not favor high rated pupils.
10. Meisgeier, 1965	Correlational Prediction Study	Factor analysis	Special ed. student-teachers	Yes	Sig. pos. corr. between successful student teaching & scholastic aptitude & achiev.; 8 personality measurers, & 3 measurers of educ. interest & attitudes.
11. Minskoff, 1967	Causal comparative Ss randomized	Mean %'s U test Spearman r	17 teachers	No	No exper.-control group diff. on productive thinking & conclusion quest. Exper. teacher ques. 88% cog-mem., 5% evaluative, 4% convergent, 3% divergent.

Table 2A. Studies of Teacher Behavior: Methodology and Outcomes

Presage-Process Studies (Cont.)

Study	Design	Statistics	Unit of Analysis	Sig?	Results & Supplementary Information
12. Schmitt, 1969	0 x 0 0 x_1 0	ANOVA	3 groups of teacher trainees, 21 EMR boys	Mixed	Use of CATTS feedback increased trainees' use of broad quest.; did not affect pupil responses. Greater use of broad quest. in soc. studies than in math.
13. Semmel, D., 1975	Correlational Prediction Study	Multi-variate & factor analyses	Trainees	No	No sig. multiple corr. Sig. corr. between experience w/children & lower rate of off-task behav.; experience negatively corr. w/rate of pupil initiated talk.
14. Stuck & Wyne, 1971	Causal comparative	MANOVA	Classrooms (27)	No	Verbal behavior of teachers in special classes not sig. diff. from reg. class teachers.
15. Weaver, 1969	0 x 0 0 x_1 0	ANOVA	18 teachers assigned to 6 exp. groups, 30 EMR children	3 of 18 hypoth.	CATTS feedback trainees showed greater gains in time in div. categories. High expectancies were better during baseline; low expectancy group was better during training.
16. Werry & Quay, 1969	Causal comparative	Mean frequency %'s mean comparisons	Groups	Mixed	Large proportion of classroom deviant behavior was non-specific. Treated problem children not sig. diff. from normal. Pre-entry problem children were sig. less attentive & received greater amount of positive teacher attention than normals.

Table 3. Studies of Teacher Behavior: Description

Presage-Product Studies

Study	Independent Variables	Dependent Variables	Subjects / N	Instrument/ Reliability
1. Greenwood, Hops, & Walker, 1975	Teacher preparation in program on group behavior management. "Program for academic survival skills."	Pupil behavior. Standardized achievement in reading and math.	Low achieving, low survival skill, normal IQ. 1st, 2nd, & 3rd grade pupils. 54 experimental & 42 control, in 17 classes in 2 schools. 6 target pupils per class.	Academic survival skill system; Ir.92 WRAT.
2. Gozali & Meyen, 1970	Teacher expectancies.	Pupil achievement.	16 EMR classes, 16 EMR teachers, 162 pupils.	Stanford Achievement.
3. Haskett, 1969	Teacher expectancy of pupil social development.	Academic & social achievement of EMR.	267 EMR pupils in 32 EMR classes.	Metropolitan Achievement Test. Syracuse Scale of Social Relations.
4. Jones, 1974	Degree of physical dependency.	Achievement & interpersonal relationships, locus of control.	102 children, CA 6 to 16 in special school for orthopedically disabled.	Bialer Locus of Control Scale. No reliability information on teacher questionnaire on pupil ambulation, achievement.
5. Richmond & Dalton, 1973	Teacher rating of pupil (hi-low) on social, academic, & emotional status.	Pupil self rating on social, academic, & emotional status.	100 EMR pupils. 8 teachers.	Perform. Profile for Young Mod. & Mild Retarded. R.S. Coopersmith Self-Esteem Inventory.
6. Scheuer, 1971	Pupil perception of teacher. Supervisor ratings of effectiveness.	Pupil gain.	169 ED boys in residential center, 20 secondary teachers, 4 supervisors.	Teacher competency check list, teacher-pupil relationship inventory, (pupil form, teacher form), Stanford Achievement.

Table 3. Studies of Teacher Behavior: Description

Presage-Product Studies (Cont.).

Study	Independent Variables	Dependent Variables	Subjects / N	Instrument/ Reliability
7. Stowitschek & Hoffmeister, 1974	Math Mini course**	Observed tutorial behaviors. Pupil math achievement.	15 EMR teachers & classes (experimental). 10 EMR teachers & classes (control).	Observation system for 15 Math Mini course skills; Cr.62 to 1.0.

**Presage-process-product study. Tutorial Behaviors are also Independent Variables; Achievement is Dependent Variable.

Table 3A. Studies of Teacher Behavior: Methodology and Outcomes

Presage-Product Studies

Study	Design	Statistics	Unit of Analysis	Sig?	Results & Supplementary Information
1. Greenwood, Hops, & Walker, 1975	R 0 x 0 0 R 0 x_1 0 0	ANOVA	Pupils	Yes	Control group sig. improved in survival skill behaviors during both math & reading. Behavior maintained one week after program terminated. Behavior changes sig. related to achievement for first grade only.
2. Gozali & Meyen, 1970	R 0 x 0 R 0 x_1 0	ANCOVA	Pupils 158 degrees of freedom.	No	Only vocab. subtest approached significance.
3. Haskett, 1968	0 x 0	Canonical analysis	Pupils	Yes	Sig. pos. correlation between teacher expectancy and student social development and achievement.
4. Jones, 1974	Causal comparative	ANCOVA chi square	Pupils	No	Physical dependency & impaired mobility not related to achiev. & relations w/ teachers & peers. Some relation between higher achiev. & internal. locus of control, irrespective of degree of mobility.
5. Richmond & Dalton, 1973	Causal comparative	ANOVA	Individual EMR pupil	Mixed	Teacher rating of academic status related to several measures of pupil self-esteem. Teacher rating of social status not related to self esteem.
6. Scheuer, 1971	Causal comparative	Pearson p.m. r	Pupils	Mixed	No sig. relation between teacher & pupil forms of T.P.I., or between pupil percept. of teacher & effectiveness rating. Sig. rel. between pupil percept. of teacher & pupil gain.
7. Stowitschek & Hoffmiester, 1974	*Teachers R 0 x 0 0; Pupils R 0 x 0 R 0 x_1 0	ANCOVA Means & SD's	Teachers	Yes	Exper. pupils sig. better on content ref. test & on WRAT. Large increases in tchr. use of specific verbal praise. Small or no incr. in use of prompting & gen. praise.

*Teachers volunteered but assigned randomly to experimental or control group.
+R = Randomized

Table 4. Studies of Teacher Behavior: Description

Process Occurrence Studies

	Observed Behaviors			
Study	Variables	Variables	Subjects / N	Instrument/ Reliability
1. Craig & Collins, 1970	Pupil-teacher verbal interaction in 3 school levels: Eleven modes of communication.		94 deaf pupils in 12 special classes in 3 schools (2 residential, one public day).	Expanded version of Flanders; Ir.83 to .98. Classification of mode of communication; Ir.90 to .99.
2. Erber & Greer, 1973	Teacher's response to failure to communicate orally with hearing impaired child.		10 teachers at school for deaf and their pupils.	No information.
3. Fink, 1972	18 categories of pupil off-task behaviors and teacher management techniques.		15 classes for ED.	Fink Interaction Analysis O.S.; Ir.85.
4. Hurley, 1968	Linquistic analysis of transcripts of teacher-pupil verbal interaction.		19 children in 2 EMR classes.	Linguistic coding system; no reliability information.
5. Lasher, Holzman, Rotberg, & Braun, 1970	Verbal and nonverbal behaviors of teacher trainees and preschool ED children.		5 teacher trainees, 1 experienced teacher, 3 groups of preschool ED children, 4 or 5 per group.	Coded transcripts derived from VTR & observer notes; no reliability information.
6. Paris & Cairns, 1971	(Ind. Var.) Lab. experiment: Three types of reinforcement; positive, negative, & nonsense word.	(Dep. Var.) Reinforcement effectiveness.	6 EMR	Two choice discrimination task.
	Classroom observation teacher's evaluative comments frequency of positive & negative social reinforcement.		6 EMR classes.	Videotape of classes. Classification of interaction; Ir.70 to .90.

Table 4A. Studies of Teacher Behavior: Methodology and Outcomes

Process Occurrence Studies

Study	Design	Statistics	Unit of Analysis	Sig?	Results & Supplementary Information
1. Craig & Collins, 1970	Survey	Frequencies & %'s	Schools (3)	--	In lang. & subject inst. teachers in all schools & at all levels dominated communication: Primary 80%; intermed. 94%; H.S. 75%. Oral mode at primary 90%; intermed. 75%; combined mode most freq. at H.S. 71%.
2. Erber & Greer, 1973	Survey	%'s	Teacher	--	Teacher response to pupil failure to understand (in order of most freq. use) was emphasis, repitition, structural change, & supplementary information.
3. Fink, 1972	Survey	Frequencies	Pupil and teacher	--	Most freq. off-task behav.: verb. interact w/teacher; refusal-restive; verb. interact w/peer; etc. Most freq. teacher controls were planned; ignoring; surface behav.; authoritative refocus; etc. Pupils off-task 60% of time.
4. Hurley, 1968	Survey	Linguistic analysis-rates & %'s	Single class (teacher, 9 pupils)	No	85% of all class talk during 2 hrs. of observ. was by teacher. Pupils averaged less than one complete sentence per utterance; teacher averaged more than 2; 17% of pupil sentences & 78% of teacher sentences were structurally complete.
5. Lasher, Holzman, Rotberg, & Braun, 1970	Description	%'s & ranks	Teachers (working in pairs) & pupils in groups.	--	High intergroup, low intragroup variability on teacher activity level. Teachers gave more attention to disruptive children.

Table 4A. Studies of Teacher Behavior: Methodology and Outcomes

Process Occurrence Studies (Cont.)

Study	Design	Statistics	Unit of Analysis	Sig?	Results & Supplementary Information
6. Paris & Cairns, 1971	R x_a 0 x_b 0 x_c 0	ANOVA	Pupils in each condition.	Yes	No difference in performance between positive & negative reinforcer. Sig. diff. between neutral and negative. EMRs learned better w/negative evaluative comments.
	Observation	Frequencies	Classrooms		Positive statements occurred indiscriminately, frequently, & in a variety of functions. Negative comments were used infrequently and informatively.

Table 5. Studies of Teacher Behavior: Description

Process-Process Studies

Study	Independent Variables	Dependent Variables	Subjects / N	Instrument/ Reliability
1. Brent, 1972	Use of tokens.	Appropriate & inapprop. pupil behavior during rest period.	6 deaf children.	Behavioral chart.
2. Fargo, 1967	Teacher taught concept to single child.	Rate of reinforcement language used, materials used, teacher-intent questions.	15 teachers--3 experienced reg., 3 inexperienced reg., 4 exper. special, 4 inexper. special, 1 undergrad. 14 EMR pupils, 15 normal, 1 deaf, 1 blind.	Videotapes of observed behaviors; Ir.92.
3. Hall, Fox et al., 1971	Extinction of inappropriate behv., reinforcement of appropriate behavior by teacher.	Level of pupil appropriate & inappropriate behavior.	6 separate case studies: special ed. & reg. class.	Observation system; Ir.85+.
4. Hulten & Kunzelmann, 1969	Teacher attention to pupil.	Pupil attending behaviors.	1 thirteen-year-old "underachieving" boy.	Cumulative observation record. No reliability information.
5. Kazdin, 1973	Vicarious reinforcement of pupils.	Pupil attending behaviors.	2 pairs of MR children, 2 target of reinforcement, 2 "adjacent peers."	Observation system; Ir.91-1.00.
6. Kazdin & Klock, 1973	Contingent, nonverbal teacher approval.	Pupil attending behaviors.	12 EMR pupils CA 7 to 10 1 teacher.	Observation system; Ir.80-1.00.
7. Kounin & Obradovic, 1968	Teacher management style in seatwork & recitation.	Pupil work involvement, pupil deviancy.	49 classrooms: 1 ED child in each class, 2 non-ED boys, 2 non-ED girls in each class.	Observation system for pupil work involvement, deviancy, & teacher management style; Ir.95 (coded from videotapes).

Table 5. Studies of Teacher Behavior: Description

Process-Process Studies (Cont.)

Study	Independent Variables	Dependent Variables	Subjects / N	Instrument/ Reliability
8. Parsonson, Baer, & Baer, 1974	Observer feedback to teacher.	Use of appropriate social contingencies.	2 kindergarden teachers of institutional MR.	Observation system; Ir.65-99.
9. Thomson, Holmberg, & Baer, 1971	Feedback training procedures. Teacher use of priming & reinforcement of peer interactions.	Increase in pupil-peer interaction.	14 preservice trainees, 2 grad. students, 7 headstart teachers, 10 headstart pupils w/low rate of peer interaction.	Observation system; Ir 80+.
10. Walker & Buckley, 1970	Teacher consequenting behavior (amt. of teacher attention).	Appropriate & inapprop. pupil behavior.	Single, 5th grade class of 31 pupils: 3 most & 3 least deviant pupils in class.	School observation form (O.S.); Ir.87-.90.

Table 5A. Studies of Teacher Behavior: Methodology and Outcomes

Process-Process Studies

Study	Design	Statistics	Unit of Analysis	Sig?	Results & Supplementary Information
1. Brent, 1972	Time series 0 0 0 x 0 x 0 x 0	%'s	Group	--	Increase in appropriate behavior.
2. Fargo, 1967	x_a 0_1 x_b 0_2* 0 x 0 +	Rates %'s linguistic analyses	Teachers, pupils	Mixed	Repetition of pupil response more frequent in teachers of pupils who were high gainers. High ratio of teacher-to-pupil talk. No correlation of gain with materials prepared by teacher.
3. Hall, Fox, et al., 1971	Time series reversal	% frequencies rates	Varied; individuals, groups, etc.	Yes	Teacher acting as experimenter & observer effected change in pupil behavior.
4. Hulten & Kunzelmann, 1969	Time series	Means	1 teacher, 1 pupil	--	Teacher attention contingent upon pupil attention increased pupil attention & was maintained when rate of teacher attention was reduced.
5. Kazcin, 1973	Time series multiple-baseline, reversal	% frequencies rates	2 "adjacent peers"	Yes	Reinforcement of attentive behavior in 2 pupils increased the behavior in 2 adjacent peers.
6. Kazdin & Klock, 1973	Time series reversal	% frequencies rates	Pupils	11 of 12	Pupil attentive behavior increased w/contigent nonverbal teacher approval.

*Teachers
+Pupils

Table 5A. Studies of Teacher Behavior: Methodology and Outcomes

Process-Process Studies (Cont.)

Study	Design	Statistics	Unit of Analysis	Sig?	Results & Supplementary Information
7. Kounin & Obradovic, 1968	Causal comparative	T-test Pearson p.m.	49 pupils in recitation, 48 pupils in seatwork	Yes	No sig. diff. between scores of ED & non-EDs. Corr. between ED & non-ED for work involvement .76; deviancy .82 in recitations; & .57 & .65 in seatwork.
8. Parsonson, Baer, & Baer, 1974	Time series multiple baseline	% frequencies rates	Teachers	Yes	Gains in attention to appro. behav. & ignoring inappro. behav. were maintained after feedback was terminated.
9. Thomson, Holmberg, & Baer, 1971	Time series multiple baselines, treatments, & reversal procedures	Rates & %'s	Individual teachers & pupils	Yes	13 of 18 target pupils' interactive behaviors increased w/increase in teacher priming & cueing.
10. Walker & Buckley, 1970	Time series baseline, treatment, reversal	Rates & conditional probabilities	3 most & 3 least deviant children in classroom & 1 teacher	No	High probability assoc. w/teacher attention to inappro. behav. by deviant children. Manipulation of teacher attention did not affect deviant pupil rates of appropriate & inappropriate behavior.

Table 6. Studies of Teacher Behavior: Description

Process-Product Studies

Study	Independent Variables	Dependent Variables	Subjects / N	Instrument/ Reliability
1. Dalton & Lynch, 1974	Two types of teacher questions: episodic & semantic.	Teacher-pupil verbal interaction. Pupil recall.	8 experimental & 2 control teachers, 8 EMR pupils per teacher.	Video & audio tapes of all lessons; Ir.98. Control recall test.
2. Hunter & Meyers, 1972	Classroom climate variables: acceptance, rejection, problem centered, directiveness, control.	Pupil behaviors: task orientation; attitude toward teacher, school & class; achievement; attendance.	117 pupils in 11 classes for EH: 10 or 11 pupils per class (CA 7-10 to 13-8). EH = non retarded with learning problem.	Revised Withall Social-Emotional Climate Index; Ir.85. WRAT; attitude inventory; Ohio Social Acceptance Scale.
3. Semmel, Sitko, & Kreider, 1973	Teacher-pupil verbal interaction.	Classes showing high or low gains on CLSCS.	12 teachers of TMR: 6 high gain CLSCS, 6 low gain CLSCS, 107 TMR pupils.	Flanders I.A. scale; Ir.75 to .87. Cain-Levine Social Competency Scale (CLSCS), communication subscale.

Table 6A. Studies of Teacher Behavior: Methodology and Outcomes

Process-Product Studies

Study	Design	Statistics	Unit of Analysis	Sig?	Results & Supplementary Information
1. Dalton & Lynch, 1974	x_a 0 x_b 0 * x_1 0 x_1 0	T-test ANOVA	Classes (questions) Pupils (recall)	1 of 3 hypoth	In episodic question lessons, pupil verbal output was greater than in semantic.
2. Hunter & Meyers, 1972	Survey	ANOVA ANCOVA Planned comparisons	Classes 4, 6 classes for each comparison	3 of 7 hypoth	Acceptance, low rejection, & gen. control favorable to pupil attendance, progress, & attitudes. Directiveness & prob. centered not rel. to pos. pupil effects. Teacher control R.O. corr. .75 with pupil effects.
3. Semmel, Sitko, & Kreider, 1973	Causal comparative	Means SD's Mean %'s t-test	TMR classrooms	3 of 8 comparisons	Ratio of expansive to restrictive teacher verbal behavior related to high communication gain. High gain teachers were less restrictive & direct than low gain. Low gain teachers were older & more experienced.

*Episodic or semantic

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CHAPTER THREE

COMPETENCY-BASED TEACHER EDUCATION PROGRAMS IN SPECIAL EDUCATION

Accountability as an issue, as a demand, and as a process is a current reality. As reflected in previous chapters, it is manifested in demands for improved teaching practices which guarantee pupil achievement and in new teacher certification policies based on performance criteria. Accountability is also reflected in judicial decisions that require justification for placement of children from minority and handicapped groups (Cohen & DeYoung, 1973; Mercer, 1974). Finally, accountability is reflected in state and federal funding which tends to support training programs that have identifiable competency-based components.

At the teacher preparation level, accountability has been translated into legislative mandates or administrative directives stipulating competency-based teacher education (CBTE). If this trend continues, pressures upon teacher education programs to adopt CBTE will, in time, also encompass special education programs. What are the implications of externally imposed CBTE upon ongoing programs? Such external imposition is necessarily a different order of consideration than internally initiated change. Preparation programs can comply (and have complied) with CBTE directives by rewriting existing curricula in behavioral terms, thus satisfying nominal CBTE requirements. But CBTE may also be viewed as an innovation designed to facilitate the accrual of a data base of knowledge about the effects of teacher behavior upon child growth. These data, in turn, are integral to the determination of competencies and performance criteria and are thus instrumental in establishing a dynamic feedback loop. CBTE concepts are broad enough to encompass a variety of training settings and local preferences, but judgments about the value of CBTE require a trial of sufficient duration to make evaluation meaningful.

During preparations for the present review, an extensive number of special education teacher preparation programs were examined in order to identify a sample of CBTE programs illustrative of the diverse settings in which the preparation of personnel for the education of handicapped children takes place. While the final sample of programs described is not exhaustive of available program descriptions, the representative sample selected does allow us to meet the objective of reporting, in some detail, the nature of current special education CBTE programs.

Several sources were utilized during the search for special education teacher preparation programs which explicitly or implicitly claimed to be CBTE programs. Final reports obtained from the Training Division of BEH were examined. Additional information on programs was secured from a review of special education literature journals and an ERIC search.

The programs selected were evaluated to determine if CBTE criteria were met and the extent to which programs could be said to be competency-based. To facilitate comparisons across the various programs, a set of tables was developed for the rapid classification of the programs. The tables provide: (1) descriptive information (Tables 7, 7A), (2) information on CBTE criteria (Tables 8, 8A), and (3) program evaluation information (Tables 9, 9A, 9B). In addition to the tabular classifications of program information, narrative descriptions of each program were written. The final descriptions were then sent to project directors for verification of the information contained in the summaries. An asterisk indicates those programs from which replies were received from project directors or other responsible personnel either by letter or phone. To insure accuracy, an effort has been made to incorporate the changes suggested by these respondents.

This chapter is divided into three major sections: The first section, which contains tabular summaries of the 18 programs reviewed, is intended to serve both as a quick reference and an advance organizer for subsequent sections. The second section contains narrative summaries of each program. Generally corresponding to the information found in the tables, these summaries examine current CBTE programs in special education in greater detail. The final section of this chapter summarizes selected programs and provides a synthesis of this information in terms of extant patterns and implications for competency-based programs in special education.

As previously indicated, the material used to prepare this chapter came from several sources so the amount of descriptive detail for each program depends directly upon the amount of information available. Where essential information was not accessible through available sources, an "NI" is entered in the tables to show that relevant information was "not indicated." Since professional judgment and interpretations were necessary to classify some program material, an attempt was made to cross-validate ambiguous information with correspondence from project directors.

Tabular Summaries of Selected Training Programs

In this section, program information is summarized in three tables: Table 7. Program Description, Table 8. CBTE Criteria, and Table 9. Evaluation. The rows in each table designate the location of a specific training program. Additional information regarding classifications used in the tabular summaries is presented prior to each table.

Table 7. This table summarizes information related to: the trainee population (columns 1-4), types of pupils served (columns 5-11), types of classroom environment employed (columns 12-15), and focus of instructional content (columns 16-17). The trainee population data have been classified into four categories: preservice regular, preservice special, inservice regular, and inservice special. The inservice designations are also coded with a "G" to indicate programs where graduate credit is given for training activity.

The "types of pupils served" section of Table 7 refers to children with whom trainees work or will work. Data are classified in terms of the following pupil descriptors: mentally handicapped (MH-noncategorical); educable, trainable, or profoundly mentally retarded (EMR, TMR, and PMR, respectively), emotionally disturbed (ED), and learning disabled (LD). The implied age range for pupils coded within these categories is 6 to 13 years. Since a few programs train teachers to work with pupils outside this age range, a preschool category and an adolescent category have been added for clarification. The final pupil category indicates pupils who are either sensory impaired (S) or physically handicapped (P).

In the next section of Table 7, classroom setting options are indicated according to three categories: self-contained, resource, and regular. An "other" column is also included for unusual administrative arrangements and teacher roles (e.g., sheltered workshops, home environment, institutions, and consultants). In the final portion of Table 7, characterization of the programs' educational theory or orientation concerning pupil learning is summarized in a pupil pedagogical orientation column, and theory or orientation in teacher training (e.g., individual, diagnostic, prescriptive) is indicated in the trainee instructional orientation column.

KEY

G = Graduate
X = Present in Program
DP = Diagnostic-Prescriptive
BM = Behavior Modification
CT = Clinical Teaching
CMC = Curriculum Materials Competency
GS = Generic Skills
II = Individualized Instruction
DEV = Developmental
N.I. = Not Indicated

Table 7. Training Program Description

Program Location	Trainee Population				Types of Pupils Served							Type of Classroom Environment				Content Focus	
	Preservice Regular	Preservice Special	Inservice Regular	Inservice Special	MH	EMR/TMR/PMR	ED	LD	Adolescent	Preschool	Sensory/Physical	Self-Contained	Resource	Regular	Other	Pupil Pedagogical	Trainee Instructional
1. Florida State University		X		G	X							X	X	X		DP	II/GS
2. Indiana University		X				EMR						X	X	X			GS
3. University of Northern Iowa		X		G	X				X			X	X	X	S/M H[1]	DP	II/GS
4. University of Texas, Austin				G						X		X				DEV	GS
5. University of Vermont				G	X							X	X	X	Consult. Teacher	BM	II
6. University of Georgia, Athens		X		G			X			X		X				DEV	CT
7. University of Minnesota-Seward		X		G	X									X		BM	
8. Montgomery County Schools, Md.				X			X	X	X			X	X	X		DP	
9. Houston Indep. Schools, Texas			X		X							X	X	X		DP	
10. University of Idaho			X			EMR				X				X		DP	II/GS
11. Ohio-EMR Program Development-"HELPS"			X	X	X	X	X	X	X		S/P	X	X	X		DP	II

KEY

G = Graduate
X = Present in Program
DP = Diagnostic-Prescriptive
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GS = Generic Skills
II = Individualized Instruction
DEV = Developmental
N.I. = Not Indicated

Table 7. Training Program Description (Cont.)

	Trainee Population				Types of Pupils Served							Type of Classroom Environment				Content Focus	
Program Location	Preservice Regular	Preservice Special	Inservice Regular	Inservice Special	MH	EMR/TMR/PMR	ED	LD	Adolescent	Preschool	Sensory/Physical	Self-Contained	Resource	Regular	Other	Pupil Pedagogical	Trainee Instructional
12. University of Connecticut				X		EMR						X					GS
13. Southern Illinois		X		X		X	X	X				NI	NI	NI			GS
14. University of Kansas, Lawrence		X		X	X	EMR			X			X	X	Main-stream	Wk. St. Coor.[2]		GS
15. University of Missouri	X	X	G	G	X	X	X	X	X	X	S/P	X	X	X	C.C.[3]		CMC
16. SUNY, Buffalo				X	X							X	X	X			CMC
17. Northwestern University				G				X									
18. Olathe United School Dist., Kansas			X	X		X	X							X	Int. Tch.[4]	BM	II

1 Severely/Multiply Handicapped
2 Work-Study Coordinator
3 Curriculum Consultant
4 Intinerant Teacher

Table 7A. Training descriptors are defined in terms of three broad categories in Table 7A: focus of training (columns 1-3), training environments (columns 4-10), duration of training (column 11), and scope of the training program (column 12).

In the "focus of training" section of Table 7A, each training program is classified according to whether its emphasis is on knowledge acquisition, skill development, or a combination of the two. For example, if trainees are required to "learn teaching methods and then demonstrate the acquisition of this content on a criterion-referenced test--but not to apply this knowledge in a performance context--the program focus is classified as knowledge acquisition. If, however, a program includes skill development components in which trainees practice specific teaching skills, then the program is classified as one which emphasizes skill development. The final category, knowledge-skill integration, refers to a program in which knowledge and skill objectives are integrated in some preplanned sequence within the total program, rather than a program which contains separate knowledge and skill components only.

Information related to training environments is classified into one of several broad categories: simulation, microteaching, lab, classrooms, natural classrooms, seminars (school-system or university-based), modules and/or workshops. Most programs use several such training delivery systems. Additional information about these systems can be found in the narrative summaries contained in the second section of this chapter.

Information in the "duration of training" column reflects the amount of time allotted for completion of training activities in the various programs. The final column indicates the scope of the training program, that is, whether the program described is a total training program, or whether the program described is a subset or component of a total program.

KEY

T = Tutoring Child One-to-One
S = School System Based
U = University Based
TP = Total Program
C = Component of Total Program

Table 7A. Training Program Description (Cont.)

Program Location	Focus of Training			Training Environments							Duration of Training	
	Knowledge Acquisition	Skill Development	Knowledge-Skill Integration	Simulation	Micro-teaching	Lab Classroom	Natural Classes	Seminars/LEA or Univ. Based	Modules	Workshop		Total Program or Component
1. Florida State University	X	X	X			X	X	U	X		2/3 years	C
2. Indiana University	X	X	X		T	X	X	U	X		2 years	C
3. University of Northern Iowa	X	X	X		T	X	X	U		X	2 years	C
4. University of Texas, Austin	X	X	X		X		X	U			36 semester hours	C
5. University of Vermont	X	X	X			X	X	U	X		2 years	TP
6. University of Georgia, Athens	X	X	X			X			X			C
7. University of Minnesota-Seward	X	X					X		X		NI	C
8. Montgomery County Schools, Md.	X	X	X	X			X	LEA	X		41 weeks	TP
9. Houston Indep. Schools, Texas	X	X					X	LEA	X		Flexible	TP
10. University of Idaho	X	X	X			X		U	X		8 hrs. a day/5 wks.	TP
11. Ohio-EMR Program Development-"HELPS"	X	X	X	X				S	X	X	Varies	TP

KEY

T = Tutoring Child One-to-One
S = School System Based
U = University Based
TP = Total Program
C = Component of Total Program

Table 7A. Training Program Description (Cont.)

Program Location	Focus of Training			Training Environments							Duration of Training	
	Knowledge Acquisition	Skill Development	Knowledge-Skill Integration	Simulation	Micro-teaching	Lab Classroom	Natural Classes	Seminars/LEA or Univ. Based	Modules	Workshop		Total Program or Component
12. University of Connecticut	X	X	X	X			X	LEA		X	40 weeks	C
13. Southern Illinois	X	X	X		X		X	U	X		Academic quarter	C
14. University of Kansas, Lawrence	X	X	X	X	T		X	U	X		Self-paced	C
15. University of Missouri	X	X	X	X	X	X	X	X	X		Self-paced	TP
16. SUNY, Buffalo	X	X								X	6 weeks	TP
17. Northwestern University	X	X		X							40 weeks	C
18. Olathe United School Dist., Kansas	X	X	X				X	LEA		X	3 weeks	TP

CBTE Criteria

The checklist which comprises Table 8 is based on those elements considered essential for a CBTE program. Table 8A is based on those characteristics that are implied or related to programs considered to have a CBTE format.

Table 8. Essential elements. Table 8 is divided into four sections, each of which is associated with specific criteria. The first section (columns 1-3) is concerned with teaching competencies. Three criteria are relevant here: (1) basis for competency selection, (2) whether or not competencies are stated in behavioral terms, and (3) whether or not competencies are made public (e.g., to students, faculty) in advance of training.

The first of these three criteria, the basis for competency selection, involves a descriptive rather than a binary classification (column 1). The basis for competency selection can be either: authoritative (A), i.e., based on trainers' professional judgment; theoretical (T), i.e., based on specific pedagogical theory; empirical (E), i.e., based on research data; or any combination of these. All three approaches assume some degree of correspondence between teaching competencies (knowledge, skills, behavior patterns) and the role of the teacher. The second criterion, stated in behavioral terms, refers to the operational terms in which given teaching competencies are stipulated (column 2). The third criterion, made public, refers to the accessibility of performance criteria prior to training (column 3). In these two columns (2-3), as well as in the remaining columns of Table 8, program information is coded as: present (x), partially present (/), not present (-), or not indicated (NI).

The next section of Table 8 (columns 4-6) contains information related to assessment criteria. Column 4, "competency-based," implies assessment criteria are based upon and consonant with stated teaching competencies.

Column 5 contains information which indicates whether or not mastery levels are specified for stated teaching competencies. The "made public" column (6) is self-explanatory. Actual assessment procedures are coded in columns 7 and 8; specifically, column 7 indicates whether trainee performance was the basis of assessment, and column 8 indicates whether the trainee's entry level was taken into account in program planning and decision making. The final column in Table 8 has coded information related to program progression, specifically whether or not the basis for progress was demonstrated competencies (CBTE) rather than time or course completion.

Table 8. CBTE Criteria
I. Essential Elements Present in Training Program

KEY

A = Authoriative
T = Theoretical
E = Empirical
NI = Not Indicated
/ = Partially Present
-- = Not Present
X = Present

Program Location	Teaching Competencies			Assessment Criteria			Assessment		Progress Thru Program
	Basis of Comp. Selection	Specified in Behav. Terms	Made Public	Comp.-Based	Mastery Levels Specified	Made Public	Performance-Based	Accounts for (Entry Level) Acquisition of Knowledge	Based on Demon. Comp. Rather than Time or Course Completion
1. Florida State University	T/E	X	X	X	X	X	X	X	X
2. Indiana University	A	X	X	X	--	NI	X	X	/
3. University of Northern Iowa	A	X	X	X	X	X	X	--	NI
4. University of Texas, Austin	A	--	X	X	--	--	X	NI	--
5. University of Vermont	T/A/E	X	X	X	X	X	X	X	X
6. University of Georgia, Athens	T/E	NI	X	X	X	X	X	NI	X
7. University of Minnesota-Seward	A	X	X	X	X	X	X	NI	/
8. Montgomery County Schools, Md.	T/A/E	X	X	/	/	X	X	/	X
9. Houston Indep. Schools, Texas	A	--	X	X	--	--	X	NI	--
10. University of Idaho	A	X	X	X	X	X	X	X	X
11. Ohio-EMR Program Development-"HELPS"	A	X	X	X	X	X	X	X	X

Table 8. CBTE Criteria

I. Essential Elements Present in Training Program (Cont.)

KEY

A = Authoriative
T = Theoretical
E = Empirical
NI = Not Indicated
/ = Partially Present
-- = Not Present
X = Present

	Teaching Competencies			Assessment Criteria			Assessment		Progress Thru Program
Program Location	Basis of Comp. Selection	Specified in Behav. Terms	Made Public	Comp.-Based	Mastery Levels Specified	Made Public	Performance-Based	Accounts for (Entry Level) Acquisition of Knowledge	Based on Demon. Comp. Rather than Time or Course Completion
12. University of Connecticut	A	X	X	X	--	X	X	NI	--
13. Southern Illinois	A	X	X	X	X	X	X	--	X
14. University of Kansas, Lawrence	T	X	X	X	X	X	X	X	X
15. University of Missouri	E	X	X	X	X	X	X	X	X
16. SUNY,Buffalo	A	X	X	X	NI	NI	X	X	/
17. Northwestern University	A	NI	NI	NI	NI	NI	X	X	--
18. Olathe United School Dist., Kansas	NI	X	X	NI	NI	NI	NI	NI	NI

Table 8A. Implied and related elements. Table 8A describes the implied and related CBTE program characteristics and considers relevant dimensions within each. The first five columns of the table deal with implied characteristics. If a trainee progresses through a program at a personalized rate or has some control over the sequence of his/her program, then the program is considered individualized and an "X" is entered in column 1. If these criteria characterize only segments of a program, with other segments assuming a more traditional format (i.e., group blocking), then the program receives a "/" in column 1.

In column 2, an "X" indicates programs where feedback in any form is present. Programs viewed as having systematic and modularized approaches to training are similarly coded in columns 3 and 4, respectively. Although these columns (2-4) may not appear to differentiate sufficiently among program approaches, this information is essential if a comprehensive portrayal of the status of CBTE in special education is to be generated. Qualitative and quantitative differences among programs related to these three characteristics are dealt with more explicitly in the narrative summaries.

Data indicating where students and programs are accountable to LEA's, universities, states, the federal government, etc., are coded in column 5. An "NI" is entered where the process and/or product of accountability could not be determined.

The second half of Table 8A (columns 6-10), "related characteristics," contains information related to elements or processes that are usually present in CBTE programs: field-centered, broadly based decision making, protocol and training materials, student participation in decision making, and research/revision orientation. For purposes of coding columns 6 through 10, the following criteria were applied for present (x) or partially present (/) conditions:

Col. 6. Field-centered: A training program was viewed as having field-centered participation if training activities actually occurred in or were coordinated with activities based in the school (e.g., a natural setting). A time criterion was also applied--field-centered activities had to represent at least 20% of the total program.

Col. 7. Broadly based decision making: A program was viewed as having a broadly based decision-making policy if, in the development, implementation, and/or maintenance of the program, reference was made to interdisciplinary or multi-group (e.g., faculty, community, teacher, student) input into program components.

Col. 8. Protocol/training materials: A program was rated as having specially designed or adapted training materials to support its program sequences if descriptions of mediated modules and/or practicum, performance-based course outlines accompanied the description of the program. Judgments about the extent of use of protocol materials or about the specific or unique characteristics of training material components were not always possible.

Col. 9. Student participation in decision making: A program was characterized as having student participation in decision making if any of the following conditions were met: (a) student attitude questionnaires related to program content, sequence, format, and/or instruction performance were completed during or following training, with this input resulting in or contributing to program revision; (b) student input was sought in an informal manner (e.g., meetings), and these responses were documented and considered in program revisions; (c) student input and exchange with faculty were integral parts of program design, implementation, and/or maintenance (e.g , joint planning meetings).

Col. 10. Research orientation and revision: A program was considered to have such an orientation if a mechanism for multiple-category feedback (e.g., trainee/pupil performance data, trainee attitude feedback, school system feedback, external evaluation data) was described, and this system was used in the revision of the development, implementation, and/or maintenance procedures of the program.

Table 8A. CBTE Criteria (Cont.)

KEY

NI = Not Indicated
/ = Partially Present
-- = Not Present
X = Present

Program Location	II. Implied Characteristics					III. Related Characteristics				
	Individual.	Feedback	Systematic	Modularization	Student/Program Accountability	Field-Centered	Broadly Based Decision Making	Protocol/Training Materials	Student Participation in Decision-Making	Research Orientation & Revision
1. Florida State University	X	X	X	X	X	X	X	X	X	X
2. Indiana University	/	X	X	/	X	X	X	X	/	X
3. University of Northern Iowa	NI	X	X	--	X	X	X	X	X	X
4. University of Texas, Austin	/	NI	X	X	NI	X	--	--	/	/
5. University of Vermont	X	X	X	X	X	X	X	X	X	X
6. University of Georgia, Athens	NI	X	X	X	X	X	X	X	X	X
7. University of Minnesota-Seward	X	X	X	X	X	X	X	X	X	X
8. Montgomery County Schools, Md.	/	X	X	X	X	X	X	X	X	X
9. Houston Indep. Schools, Texas	/	NI	X	X	NI	X	--	--	/	/
10. University of Idaho	X	X	X	X	X	X	NI	X	--	X
11. Ohio-EMR Program Development-"HELPS"	X	X	X	X	X	X	X	X	X	X
12. University of Connecticut	NI	/	X	NI	NI	X	X	/	/	X
13. Southern Illinois	X	X	X	X	X	X	--	X	--	NI

KEY

NI = Not Indicated
/ = Partially Present
-- = Not Present
X = Present

Table 8A. CBTE Criteria (Cont.)

	II. Implied Characteristics					III. Related Characteristics				
Program Location	Individual.	Feedback	Systematic	Modularization	Student/Program Accountability	Field-Centered	Broadly Based Decision Making	Protocol/Training Materials	Student Participation in Decision-Making	Research Orientation & Revision
14. University of Kansas, Lawrence	X	X	X	X	X	/	X	X	X	X
15. University of Missouri	X	X	X	X	X	X	X	X	X	/
16. SUNY, Buffalo	X	X	X	NI	NI	--	X	X	X	X
17. Northwestern University	/	X	X	X	NI	--	NI	X	NI	X
18. Olathe United School Dist., Kansas	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

Program Evaluation

The evaluation data of programs reviewed were classified into three major categories: 9. Descriptions; 9A. Design; and 9B. Results.

Table 9. Descriptions. The first category, scope of evaluation, provides information on whether the total program (TP) or a component (C) of the program is described. In the next section, the context of evaluation of trainee performance is described in terms of four situations in which trainees may be evaluated:

1. Symbolic situation: Knowledge and attitudes of trainees are ascertained, but the trainee does not generate any specific behaviors;
2. Simulated context: The trainee is asked to generate certain behaviors in a simulation mode (e.g., roleplaying, computer simulation, game format);
3. Controlled environment: The trainee generates behaviors or patterns of behaviors with actual pupils, but the number of factors that have to be dealt with at one time is reduced (e.g., laboratory classroom, microteaching, CATTS);
4. Natural situation: All the variables normally operating in the natural classroom remain intact.

In each situation, the length of time for assessing the trainee's behavior, patterns of behavior, and/or effects on the handicapped child may vary from 1 day to 3 years.

Program effectiveness criteria are also classified according to the level of performance upon which the trainee may be evaluated. These levels include:

1. the change in knowledge as a result of training;
2. the change in attitude as a result of training;

3. the change in pattern of behavior as a result of training; and

4. the change in the environment, or the complex interacting set of patterns of behavior, as a result of training.

In the final section of Table 9, assessment measures are classified according to whether they are norm-referenced or criterion-referenced.

Table 9. Program Evaluation: Descriptions

KEY

TP = Total Program
C = Component of Total Program

Program Location	Scope of Evaluation	Context of Evaluation				Effectiveness Criteria				Assessment Measure	
		Symbolic	Simulated	Controlled	Natural	Knowledge	Attitude	Pattern of Behavior	Environment Change	Norm-Based	Criterion-Referenced
1. Florida State University	TP	X	X	X	X	X	X	X	X		X
2. Indiana University	C	X	X	X	X	X		X	X		X
3. University of Northern Iowa	C	X		X	X	X		X	X	X	X
4. University of Texas, Austin	No	Data									
5. University of Vermont	TP	X		X	X	X		X	X		X
6. University of Georgia, Athens	TP	X			X	X	X	X	X		X
7. University of Minnesota-Seward	C				X	X		X	X		X
8. Montgomery County Schools, Md.	TP	X	X	X	X	X	X	X		X	X
9. Houston Indep. Schools, Texas	No	Data									
10. University of Idaho	C	X		X		X					X
11. Ohio-EMR Program Development-"HELPS"	T	X	X	X	X	X	X	X	X		X
12. University of Connecticut	TP	X			X	X		X	X		X
13. Southern Illinois	C		X		X	X		X			X
14. University of Kansas, Lawrence	TP	X	X	X	X	X	X	X			X
15. University of Missouri	TP	X	X	X	X	X		X	X		X

Table 9. Program Evaluation: Descriptions (Cont.)

KEY

TP = Total Program
C = Component of Total Program

Program Location	Scope of Evaluation	Context of Evaluation				Effectiveness Criteria				Assessment Measure	
		Symbolic	Simulated	Controlled	Natural	Knowledge	Attitude	Pattern of Behavior	Environment Change	Norm-Based	Criterion-Referenced
16. SUNY, Buffalo	TP	X		X	X	X	X	X			
17. Northwestern University	TP	X	X			X					X
18. Olathe United School Dist., Kansas	C				X	X		X	X		X

Table 9A. Design. Programs that have provided evaluation data are described in Table 9A according to the nature of the evaluation design employed. The first two sections indicate trainee group specifications and validation group (e.g., pupils) specifications. Included under the evaluation of trainee groups are: (1) the number of trainees in each group; (2) whether assignment to the group was random (R) or non-random (NR); and (3) the testing procedures employed, i.e., pretest (Pre), posttest (Post), both pre and post (PP) measures, time series (TS), and rating scales (RS). Validation group data are also classified according to the number in each group, selection procedures, and testing procedures. The next section of Table 9A provides a description of measurement instruments employed for evaluation. Under this classification are rating scales (RS), observation systems (OS), and interview and survey techniques. The presence or absence of reliability measures is also noted. Descriptions of data analysis are provided in the final section of Table 9A. Data analysis is classified as either descriptive or inferential, with notation as to the statistical test employed.

Table 9A.

Groups:

R = Random

NR = Non-Random

Testing Procedures:

Pre = Pretest

Post = Posttest

PP = Both pre and post

TS = Time Series

RS = Rating Scale

Other Variables:

* = Inter-rater

⊛ = Intra-rater

** = Adult Validation Group

+ = Equal N Control Group

++ = Control Group - 1 Year Only

No/ = No. Trainees per cycle

/No = No. of cycles

(**) = No. of pupils per trainee

Data Analysis:

TT = T Test

ANOVA = Analysis of Variance

SS = Single Subject

RO = Rank Order

% = Percentage

Instrumentation:

O = Opinion Survey

SD = Semantic Differential

RS = Rating Scale

OS = Observation System

PPT = Written Exam

Table 9A. Program Evaluation: Design

	Trainee Groups			Validation Groups (Pupils)			Instrumentation		Data Analysis	
Program Location	No.	Selection	Testing Procedure	No.	Selection	Testing Procedure	Instruments	Reliability Reported	Descriptive	Inferential
1. Florida State University	12/5	NR	PP	NI	NR	TS	PPT	--	%	
2. Indiana University	30/3	NR(R++)	TS	14	NR	TS	PPT/OS	.79*	SS	ANOVA
3. University of Northern Iowa	296	NR	Post	278	NR	PP	PPT/OS	.54-.95*	SS	
4. University of Texas, Austin		No Data								
5. University of Vermont	8/6	NR	PP	1440	NR	TS	OS	--	SS	
6. University of Georgia, Athens	13/NI	NR	RS/PP	8	NR	Perf. RS	RS	.75	SS	
7. University of Minnesota-Seward	4/4	NI	PP	NI	NR	TS	O/OS	--	SS	
8. Montgomery County Schools, Md.	8/3	NR	PP	--	--	--	O/RS	--	SS	
9. Houston Indep. Schools, Texas		No Data								
10. University of Idaho	7	NR	PP	--	--	--	O	--	%	
11. Ohio-EMR Program Development-"HELPS"	50	NR	PP	--	NR	PP	PPT	--	X	

Table 9A. Program Evaluation: Design (Cont.)

	Program Location	Trainee Groups			Validation Groups (Pupils)			Instrumentation		Data Analysis	
		No.	Selection	Testing Procedure	No.	Selection	Testing Procedure	Instruments	Reliability Reported	Descriptive	Inferential
12.	University of Connecticut	15,10,25/3	NR(++)	Perf. RS	**	NR	--	SD/RS/OS	--	SS	
13.	Southern Illinois	757/10	NR	Perf. RS	2-3**	NR	--	RS	--		TT
14.	University of Kansas, Lawrence	600-700	NR	PP	**	NR	PP	O/SD/PPP	--	%	
15.	University of Missouri	NI	NR	PP	--	--	--	--	--		
16.	SUNY, Buffalo	30+	R	PP	30+	R	PP	RS/OS/PPT	.85		TT/ANOVA
17.	Northwestern University	17/2	NI	PP	6**	NR	P	Q	--	SS	TT
18.	Olathe United School Dist., Kansas	NI	NR	PP	NI	NR	PP	PPT	--	SS	

Table 9B. Results. The information in this table specifies the independent and dependent variables involved in program evaluation. The final column indicates the general status of reported results, i.e., positive, negative, mixed. This table is related to the information on evaluation design found in Table 9A. Some evaluators provide results of total program assessment; others specify the outcome of examination of program components or modules. Naturally, when the unit of evaluation is more global, there is less information provided regarding specific contributions to given outcomes. Conversely, when the unit of study is smaller, there is more information on those factors which generated the results obtained.

Table 9B. Program Evaluation: Results

Program Location	Independent Variables	Dependent Measures	Results
1. Florida State University	Perf. based training	Trainee attitude/ knowledge/perf.	Positive
2. Indiana University	Perf. based training	Trainee perf. pupil change	Positive
3. University of Northern Iowa	Perf. based training	Trainee perf. pupil change	Positive
4. University of Texas, Austin	No Data		
5. University of Vermont	Consulting tch. program	Pupil change	Positive
6. University of Georgia, Athens	Dev. therapy modules & team tchng. practicum	Pupil change	Positive
7. University of Minnesota-Seward	Internship	Pupil change	Positive
8. Montgomery County Schools, Md.	Internship	Trainee attitude trainee performance	Positive
9. Houston Indep. Schools, Texas	No Data		
10. University of Idaho	Training Institute	Trainee attitude trainee knowledge	Positive
11. Ohio-EMR Program Development-"HELPS"	Training modules	Trainee perf. pupil change	
12. University of Connecticut	Supervisor training	Supervisor change student teacher att.	Mixed
13. Southern Illinois	Minicourse module tapes	Trainee performance	No differences
14. University of Kansas, Lawrence	Knowledge/perf. based training	Trainee performance	Positive
15. University of Missouri	Curriculum consultant modules	Trainee knowledge of curriculum	Positive
16. SUNY, Buffalo	Curriculum dev. workshop	Trainee attitude, knowledge, perf.	Positive
17. Northwestern University	Comput. simulation/clinical diagnosis	Trainee attitude trainee knowledge	Positive
18. Olathe United School Dist., Kansas	Methods & material consultant program	Trainee knowledge pupil change	Positive

Narrative Summaries of Selected Training Programs

This section contains narrative summaries describing 18 special education teacher training programs. As indicated below, these summaries have been grouped according to four types of programs:

I. Degree Granting Programs

1. Florida State University, Tallahassee
2. Indiana University, Bloomington
3. University of Northern Iowa, Cedar Falls
4. University of Texas, Austin
5. University of Vermont, Burlington

II. Combined Training and Child-Service Programs

6. University of Georgia, Athens
7. University of Minnesota, Seward Project, Minneapolis

III. Inservice Training Programs

8. Montgomery County School District, Rockville, Maryland
9. Houston Independent School District, Texas
10. University of Idaho, Pocatello
11. Ohio: EMR Program Development, "HELPS"

IV. Modular and Workshop Programs

12. University of Connecticut, Storrs
13. Southern Illinois University, Carbondale
14. University of Kansas, Lawrence
15. University of Missouri, Columbia
16. State University College, Buffalo, New York
17. Northwestern University, Evanston, Illinois
18. Olathe United School District, Olathe, Kansas

Project: The Clinical Teacher Model Project

Director: Louis Schwartz*

Location: Florida State University, Tallahassee, Florida

Program Description

The clinical teacher program is geared toward preservice training (juniors, seniors, master's students) of teachers of mildly handicapped children (EMR, LD, ED), although some inservice projects are being incorporated. Students who graduate from the program are awarded bachelor's and master's degrees, as well as four teaching certificates in special education from the state of Florida (MR, LD, ED, and Varying Exceptionalities).

The focus of the project is on those skills, knowledge, and attitudes essential to the teacher in preparing the mildly handicapped in a resource room to function in a regular classroom. The trainee program operates at the university on an individualized basis, utilizing instructional modules, and at various field locations (preschools and public schools). Since this is a performance-based program, there is no standard time set for program completion. However, staff members feel it is possible to complete the curriculum in two to three years.

The Clinical Teacher Model Project perceives the role of the clinical teacher as one who can deal successfully with children with a range of handicapping conditions and assist them in attaining those specific pupil skills that will enable them to succeed in the regular classroom. Four major competencies are stipulated for the clinical teacher: observation, diagnosis, intervention, and evaluation.

Individual modules are the basic framework for the instructional program. Each module provides the trainee with objectives, instructional activities, and criteria for demonstrating competencies (Lake, 1974, p. 4).

The curriculum lists 24 modules broken down into five major sequences: knowledge, diagnosis, intervention, evaluation, and clinical teaching. The trainees progress through the modules at their own rate. Data on individual progress through the modules are stored in a computer in terms of task characteristics, learner characteristics, and performance and are reported on a weekly basis to staff and student personnel. Following a demonstration of knowledge through the system of modules and observations of special classes (junior year), the trainee progresses through a practicum, laboratory or simulated training condition (seniors), an internship (one quarter--master's level), and finally actual employment full-time in a classroom. Assessment of teacher competencies and skills is in terms of overt teaching skills, trainee behaviors, time sampling, and product measurement of teacher and pupil achievement. A trainee's progress through the program is based on demonstrated competencies rather than on a standard time or course length.

CBTE Criteria

The Florida Clinical Teacher Model Project meets those criteria essential to competency-based teacher education programs. It is characterized by a number of supporting elements of CBTE programs. The instructional program is highly individualized. Each trainee takes mastery tests related to individual modules to determine competency level and needs. The trainee then selects modules in his/her own preferred sequence, meets with the clinical professor to select the performance criteria and resources to be used for each module, and then proceeds to work at his/her own pace.

Feedback is provided weekly by computer printouts, including the individual's performance records and the clinical professor's report. Each trainee is held accountable for performance indicated by his/her mastery of the specified competencies.

The project is field-centered with an observation, practicum, and internship at preschools or public elementary schools in neighboring counties. The first edition of the model was produced by a team of experts in the fields of teacher education, curriculum design, evaluation, behavioral psychology, media, computer programming, and research design and analysis. The trainees have a significant input into program development and revision.

The last stage of the project involves the graduates' teaching full-time for one to two years, during which performance and product measurement of teacher behaviors and pupil's achievement are obtained.

Program Evaluation

The Clinical Teacher Model Project had 15 juniors, 10 seniors, and 10 master's degree candidates during the 1972-73 year. These master's interns were to be the first program graduates (1973). Project participants were not recruited actively but were selected from those who applied. Selection was based on three criteria: (1) Does the student want to teach? (2) Is he/she interested in teaching handicapped children? (3) Does he/she seem well suited to the independent learning atmosphere of the program?

Both the trainee group and its respective pupil groups (internship and teaching) were assessed by means of criterion-referenced measures including papers, tests, essays, and demonstrated performance (or whatever performance criteria were specified for individual modules). In addition, the trainees were assessed in terms of overt teaching skills and behaviors in restricted teaching situations. Performance and product measures of teacher behaviors and pupil achievement were also recorded for evaluative purposes. The single trainee was considered the individual unit of statistical analysis. Relevant data on each trainee were stored in the computer and reported periodically.

The project's design for the summative or final evaluation of the program (including documentation of acquired competencies of trainees and pupil outcomes) was projected for the summer of 1974. However, some evaluation procedures were implemented by 1973 and included the following: logical analysis, opinion survey, interviews, observation, and student participation in evaluation. According to Lake (1974):

> The Project's Summary of Evaluation Findings for Fall-Winter, 1972-73, showed that juniors had been successful in every module attempted, with an average mastery level on the Clinical Teacher Model (knowledge) component of 87 percent. Senior trainees had successfully completed every module they attempted, and their average mastery level on the diagnosis competency was above 90 percent. A Problems and Benefits Analysis administered to first and second year trainees indicated the need for further revision of the presentation of goals and objectives, instructional content, and instructional resources. . .. Responses of the Clinical Teacher Trainees on the benefit analysis survey were overwhelmingly positive. (p. 9)

Assessment procedures included observation of teacher behaviors in the actual classroom, as well as time samplings of pupil achievement. All trainees were observed while teaching full-time for at least one year. Some of the trainees were observed (and teacher and pupil behaviors recorded) for a period of up to two years.

In summary, the Clinical Teacher Model Project exhibits those characteristics believed to be essential to competency-based teacher education programs. A summative evaluation is forthcoming, but results and recorded attitudes to date are positive.

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Schwartz, L., Oseroff, A., Drucker, H., & Schwartz, R. Innovative non-categorical interrelated projects in the education of the handicapped. A paper from the Proceedings of the Special Study Institute. Tallahassee, Fla.: Florida State University, January, 1972.

Project: Undergraduate Program for Training Teachers of the Mildly Handicapped

Director: M. Sitko*

Location: Department of Special Education, Indiana University, Bloomington

Program Description

The Mildly Handicapped Program is a two year, university-based training program. The program has been fully operational since the fall of 1972, when the first group of junior level trainees was admitted. The average size for each of the three classes was thirty trainees.

Students are trained to provide direct or indirect services to mildly handicapped children classified as mentally retarded and/or behaviorally disordered in both regular and special classes. The focus of the program research is knowledge-skill integration. The trainee, over time, is given more and more responsibility and is assessed on more complex teaching performances in which s/he must successfully integrate previously acquired knowledge and skill.

Training occurs in traditional lecture situations and practical teaching activities beginning with one-to-one tutoring and progresses to small group instruction; next the trainee assumes responsibility for an entire class (in a demonstration class). The final teaching practicum occurs in a natural classroom setting. In all these instances, trainee teaching performance is observed, coded, and stored, so that appropriate analyses can be performed. The performance of the first class to graduate is now being similarly observed, coded, and stored for maintenance analyses.

The training program emphasizes the development of interactive teaching skills. This process is aided by means of the Computer Assisted Teacher Training System (CATTS) (Semmel, Olson, & Weiske, 1973) which provides real-time feedback of teacher/pupil behaviors to the trainee while s/he is engaged in teaching.

CBTE Criteria

Trainees in the Mildly Handicapped Program (MHP) at Indiana University are expected to acquire competencies in six general areas: (a) the use of observational techniques; (b) organization, administration, and management of educational environments; (c) methods of academic assessment; (d) communication-consultation techniques; (e) methods of group analysis; and (f) decision-making skills. Each of these general areas of teacher competencies is delineated in terms of more specific behavioral skills. Under the general competency, "use of observational techniques," for example can be found: "select and justify the use of appropriate observational instruments" and "use instantaneous and delayed computerized feedback of teacher-pupil interactions for purposes of decision making and classroom instruction." Most delineated competencies are at least as specific as these two examples, although there are a few exceptions. Under the general competency, "behavior management," the following specific competencies are among the 41 listed: "communicate effectively with children" and "design an effective environment for children." All competency requirements are made public.

The teaching competencies are presented in a detailed outline, but the assessment criteria are not. The training program is founded on a competency-based model, but assessment criteria are implied rather than specifically stated. The probable causes for this ambiguity, are the multiple environments in which evaluation occurs and the highly individualized nature that some evaluation activities assume.

The model used in the MHP can be characterized as a three-dimensional matrix (see Semmel & Thiagarajan, 1974). In one dimension, an effective teacher is viewed as one who can: (a) discriminate among relevant teaching performances; (b) generate performances at specific time; and (c) evaluate the effect of these performances. This discrimination-generation-evaluation cycle can occur in one of three contexts: (a) in individual behaviors, (b) in behavior clusters, or (c) in total teaching environments. These three contexts constitute the second dimension of the model. The third dimension of the model involves the setting in which training takes place: (a) a simulated teaching setting, (b) a controlled (laboratory) teaching situation, or (c) a natural classroom.

With this complex model for training, competence and knowledge acquisition is assessed in a variety of formats and contexts. The MHP accounts for knowledge acquisition on criterion-referenced tests both during and following traditional course work and training modules. Specific competencies are assessed with observation systems in both controlled and natural settings. However, mastery levels for knowledge acquisition and teaching competencies were not indicated. Also, the specific sequence of assessment/training was not delineated, but must be inferred from the training model.

As the teaching model suggests, training is systematic, with the trainee experiencing a graduated set of practicum activities in which students apply knowledge and skills in ever increasing patterns of integration. The most unique aspect of the training program is the method of feedback used during the teaching practicum experiences. Trainees learn several observation coding systems and take turns observing and coding each others' teaching performance and pupil behaviors in special classroom settings. The training program utilizes the Computer-Assisted Teacher Training System (CATTS) developed by Semmel (1975). In CATTS, coded information is transmitted from coding boxes directly to a PDP-12 computer which then summarizes and analyzes the observation data. The computer also makes instantaneous and/or delayed feedback available to the trainee in the teaching situation. This feedback may involve a status report of one or several teaching skills and/or the consequences of teaching skills on pupil performance (e.g., level of questioning behavior). The feedback which can take one or more than one form, may be instantaneous or delayed. A scope or video display maybe available to the trainee while s/he is teaching (e.g., data on selected behaviors are transformed into a graphic display and transmitted on a video screen: As the trainee's performance shifts in a desirable or undesirable direction, the graph line shifts in a corresponding direction). Another option is a hardcopy printout, available to the trainee after teaching a lesson. The computer provides the trainee with a quantitative summary of a variety of classroom events, e.g., degree of pupil participation, degree of on-task and off-task behavior, reinforcement schedules used, etc.

Since the MHP is a small program, the trainees must meet the following entrance requirements: have a grade point average of at least 2.50; be a junior level student, have previous experience with children, have three letters of recommendation; and have an interview with a faculty member in the Department of Special Education. For administrative purposes, all students must complete a specific sequence of courses, but there is a great degree of individualization and criterion-referenced assessment within most courses.

The trainees and the program are accountable to the university and the state of Indiana for meeting training and certification requirements. The program is field-centered for practicum experience (senior year student-teaching), but additional student teaching experiences occur in demonstration classrooms which permit access to CATTS.

Program decision making involves coordination with other university departments, LEA's, parent groups, and the Indiana Department of Public Instruction. The extent of this collaboration has yet to be formalized and documented. Student role in decision making was not indicated, but students do select the teacher/pupil performance categories on which they receive

CATTS feedback.

Extensive use is made of protocol materials. These are used to train observer-coders and to assist trainees to discriminate specific teaching behaviors, but video tapes of actual trainee teaching behavior are also made available for review and analysis. Training materials include modules on selected teacher skills (e.g., Designing Games for Handicapped Children) which are made available through cooperative arrangement with the Center for Innovation in Teaching the Handicapped.

The program is role-integrated, since trainees are required to discriminate, generate, and evaluate increasingly complex behavior patterns. The program also is career continuous: Trainees who graduated last spring are being followed-up in their first teaching assignments on the same observation systems used during training to assess the maintenance level and effect of knowledge and skills acquired. Follow-up procedures are also anticipated for subsequent graduates.

The program reflects a research/revision orientation. This is evidenced in the continuous refinement and expansion of observation systems and in the numerous research questions that are and can be addressed within the context of a CATTS training program.

Program Evaluation

Empirical research with CATTS has been conducted since the first group of trainees entered the MHP in the fall of 1973. This intensive research/ evaluation process encompasses the skill development aspects of the training program. Most data are collected on juniors in a controlled (laboratory) classroom.

The evaluation design is a single subject design, with approximately 30 trainees assigned to one of three experimental conditions (feedback conditions):

(a) videoscope feedback (instantaneous), (b) hardcopy printout feedback (immediate), and (c) a videotape replay and superiority feedback (delay), and (d) varied combinations of "a" through "c." A control group was also included during the first year of the research project (1972). Each year, trainees may be randomly assigned to any combination of the feedback conditions.

A repeated measure analysis of variance is used to analyze performance data, with baseline performance compared with treatment performance (trials collapsed) for each subject. Performance data across subjects are considered.

Reported results have been positive in favor of the combination feedback treatment. The teaching performance of the first group of trainees (entered in the fall, 1973) is now being evaluated with portable observation coding units to determine if the initial superiority of the combination feedback training has been maintained and transfers to the natural setting. A comprehensive evaluation of all existing trainee data will be completed in the summer, 1975.

The teaching experiences and practica of trainees in the MHP involve assessment of trainee and pupil performance in a natural setting. In addition, graduates are to be observed during their first-year teaching assignments, and teacher outcome measures and similar pupil outcome measures will be collected and analyzed. Therefore, the overall program can be characterized as one which includes collection and analyses of trainee and pupil data over extended periods of time.

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Project: Performance-Based Teacher Education

Director: L. Courtage*

Location: Division of Special Education, Department of Curriculum Instruction, University of Northern Iowa, Cedar Falls

Program Description

This program prepares special education trainees both at the undergraduate and master's level. The program is characterized as noncategorical, and a broad range of practicum experiences are available to trainees. This range applies both to pupils and classroom environments. For example, trainees have practice in LD resources rooms, EMR primary or secondary self-contained classes, TMR classes, and classrooms for the behaviorally disordered. About two-thirds of the trainees select the latter two options for their respective practica.

The content focus in this program reflects a diagnostic-prescriptive orientation, with the emphasis on designing individualized instruction for pupils with whom trainees interact. The training focus includes knowledge acquisition and skill development, as well as integration of the two. During the first semester of the program, the trainees are provided with an overview of exceptional children. In addition, they are required to visit community agencies and to spend several hours a week in contact with exceptional children.

During the second semester, trainees take an Instructional Input I course and a Management Input I course, as well as the Phase I practicum. The emphasis in these three activities is one-to-one instruction (tutoring) of an exceptional child, which may occur in the Northern Iowa Instructional Lab (NIIL) or off-campus. The practicum forms the core in which information from the two input courses is applied. The progress of both the trainee and the pupil with which s/he works is continually monitored by personnel from

NIIL, who can recommend remediation or modification in any of the three components to insure true integration and successful progress of trainee and pupil. The structure of the third semester is similar to the second, except that the emphasis of the second Input course and the Phase II practicum is on group instruction and management. During the final semester of the program, the trainee completes course work in allied disciplines and engages in student teaching. Extensive documentation and tracking of trainees occur only during the second and third semesters in the program.

CBTE Criteria

In terms of the selected criteria, this program closely adheres to the ideal of a CBTE format. There are only two apparent digressions from the essential CBTE format. One is the absence of specified mastery levels of assessment criteria for many of the trainee performance objectives. Although the criteria are fairly specific, some subjective interpretation is required. The second digression is the absence of any specific entry level requirements for either the undergraduate or graduate level, although recycling is designated as an option for remediation. All other essential elements of a CBTE program are present in the program. An inference about the basis of competency selection has to be made (authoritative), but the other elements are documented with a high degree of specificity. This specificity applies particularly to trainee performance objectives and pupil performance objectives.

The implied and related CBTE characteristic of this program are most impressive, especially in relation to the amount and nature of feedback, the procedures used in student and program accountability, and the varied input used in decision making. Trainees are required to complete a form for every contact hour they have with pupils; this form includes pupil performance data during practica in Phases I and II. In addition, they are required to complete evaluation forms on every lecture on instruction and management attended during input courses I and II. And, finally, each trainee is rated at least once every seven days by a NIIL representative during Phase I. In Phase II, the NIIL representative meets at least once a week with the trainee, but the number of direct observation hours varies. The feedback data from these several sources are stored/processed by a computer and are available within a 24 hour period for review. Data for summary review are also accessible.

The variety of feedback systems operating in this program is an integral part of both student and program accountability. If 25% of the trainees are unsuccessful in a training component, this indicates a need for a program adjustment (i.e., change in content, structure, or instructor). If one trainee is unsuccessful in a component of a program, an adjustment is made in his/her personal program. Included in the determination of trainee and/or program success is the progress made by pupils taught by trainees.

The trainees are also accountable to the parents of the children with whom the trainee works during Phase I. Each trainee meets twice with parents, once at the beginning and once at the end of the semester. In addition, the trainee must submit a progress report to parents after every third contact hour with the child.

The trainee is also accountable to the classroom teacher. In Phase I, the trainee holds an initial and a final conference with the teacher of the child whom the trainee will tutor and submits weekly progress reports to the teacher on pupil progress. In Phase II, the trainee has an initial conference with the cooperating teacher. Then, s/he has one conference a week with the teacher for planning and evaluation. And, finally, there is a midterm and final conference related to the trainee competence in group instruction.

The program also holds itself accountable to school systems which permit placement of trainees. The NIIL coordinator meets three times a year with school administrators to discuss mutual problems and concerns. The NIIL representative for each trainee is available on an in-call basis to meet with the tutorial coordinator during Phase I, and s/he is required to meet three times a semester with the trainee's cooperating teacher during Phase II.

In this program, there is some degree of overlap between accountability processes and those used in decision making. For example, a formal conference is held for each trainee at the end of the Phase I and Phase II semesters. In attendance are the NIIL coordinator, the NIIL representative assigned to the trainee, the faculty advisor, managerial and curricular input instructors, a student advisory board representative, and the trainee. At the conference, the trainee's progress is reviewed, and additions or modifications are agreed upon by those present.

The program annually sponsors a workshop for cooperating teachers who have had trainees in their classrooms. The workshop format and content are based on teacher perceived needs, which are obtained from a structured questionnaire. Information from these questionnaires also often results in program modifications (e.g., conferences with trainees, teacher and NIIL representative, all day visits to classrooms before beginning practicum).

The program also provides for external evaluations by representatives of administrators from schools in which trainees are placed and by an evaluator from the department of special education at another university. The program also has a Special Education Advisory Committee of state and community members who are involved in service to handicapped children. The feedback from these external sources, as well as that obtained internally, is considered and often incorporated into program operations.

Although students are trained in blocks for the input courses, their progress within the courses and their assignment to practica are individualized. Program progression is very systematic, and activities in practica are tied directly to course-related material. The program is not modularized, but distinct content/activity chunks are discernible.

Program Evaluation

The scope of evaluation includes collection of trainee and pupil data during the second (Phase I) and third (Phase II) semesters of training. The context of evaluation involves evaluation of trainee and pupil in a tutorial situation (controlled) and in a group instruction situation (natural). The effectiveness of training is evaluated in terms of both trainee and pupil performance. Assessment is primarily criterion-referenced both for trainees and pupils, but trainees are also given an overall quartile ranking in relation to each other at the end of Phase I and II.

A total of 296 trainees completed this program in 1973-1974, and evaluation was based on performance data. Selection procedures were not indicated. Two hundred seventy-eight children were served during this period. The selection of these children was varied; teacher or parent referral was one procedure indicated. Performance data are also obtained on every child for every trainee contact hour.

No specific instruments were used for trainees; they were rated in terms of certain performance objectives and in terms of the performance of their pupils. Ratings or trainees could range from outstanding to poor on a 5-category rating scale. Ratings for pupils were also based on a 5-category scale, ranging from "surpassed educational objective" to "regressed."

The only reliability data reported were inter-rater reliability for trainee observers. The coefficients ranged from the low .50's to .92, with a mean coefficient of .68 being reported for 1973-1974.

The data analysis was totally descriptive, and only summary performance data (ratings) are provided for trainees and pupils.

In terms of available descriptive data, results are positive. In the 1973-74 year, for example, 94% of the trainees achieved satisfactory or above ratings on performance criteria in Phase I. In Phase II, 97% received a satisfactory or better rating. The majority of these trainees fell in the good or outstanding range. As for pupils served, 72% achieved or surpassed objectives established for them. The remaining 28% made progress toward the objective, and none of the pupils regressed.

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Project: Staff Training Program for Early Childhood Education for Handicapped Children

Director: J. Harvey and E. Gotts

Location: The University of Texas, Austin

Program Description

The Special Education Department at the University of Texas (Austin) offers a M.Ed. or M.A. (36 semester hours) in early childhood education for handicapped children. Although a specific instructional organization is not indicated, practicum activities occur in association with a self-contained preschool class for the handicapped. The content focus is developmental, with the emphasis on a strong knowledge base integrated with direct experience with children and their parents.

During the fall semester, trainees attend seminars in developmental assessment, precision teaching, child development, parent education, and the adaption of early learning environments. In the spring, trainees attend seminars in group teaching, developmental assessment, problems and issues in early education of the handicapped, adapted curriculum planning, and activity, material, and media evaluation. These spring seminars are coupled with a parent education practicum and a teaching practicum.

Each seminar includes a performance or skill component. Trainees take full responsibility for the operation of a preschool class, and activities related to it are coordinated and integrated with seminar assignments. In addition to working with preschool handicapped children in the classroom, trainees also participate in microteaching exercises with their peers.

In addition to these seminars and practica, trainees must also complete course requirements in allied fields in order to receive a master's degree.

CBTE Criteria

The teaching competencies of this training program are defined in terms of six broad competency clusters: (a) teaching-related skills, (b) parent education and involvement skills, (c) service delivery models, (d) professional identity, (e) interpersonal skills, and (f) research utilization skills. The basis for the selection of these competency clusters was authoritative, and each cluster was accompanied by a strong rationale. No specific information was given about assessment criteria or desired competency mastery levels, but performance-based assessment appears to be an integral part of the total program. For administrative purposes, courses and practica are designated as three semester hour time blocks. Actual course work is designed in terms of minicourses with continuous practicum-related activities.

Individualization of training activities is accomplished through practicum assignments and electives outside the Special Education Department. All trainees are required to complete a specific within-department course sequence.

Programming appears to be systematic, and many of the instructional units are modularized. Students are encouraged to react to program components, but the extent and nature of this and subsequent feedback to the students were not detailed.

In addition to working in the preschool classroom at the university, trainees are encouraged to work in relevant field sites within the Houston community to comply with formal practica requirements. They are also encouraged to develop and implement workshops for parents of preschool handicapped children.

There was no reference to decision-making policies or protocol/training materials in the available information. Most program revisions appear to be based on a reduction of financial support rather than on evaluation data.

Program Evaluation

No evaluation data were reported in the project report which was the single source of information about this program.

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Project: The Consulting Teacher Program

Director: H. S. McKenzie*

Location: University of Vermont, Burlington

Program Description

The Vermont Consulting Teacher Program incorporates both the training of learning specialists (called "consulting teachers" at the graduate level, "responsive teachers" at the undergraduate level) and the in-service education of regular class teachers to provide service to children designated as eligible for special class placement. The aim incorporated in the states 10-year plan for special education, is to provide professional service so that these eligible children may remain in regular classes. A service model was developed (Fox, 1973; McKenzie et al., 1970) which describes the criteria for pupil referral and the development of an individual instructional program which centers upon the principles of applied behavior analysis.

Consulting teachers are trained in a two-year program which includes formal course work and practica. Trainees selected for the program are experienced classroom teachers. Skills and knowledge emphasized in course work are individualized instruction, behavior theory, and classroom research. Practica are conducted in laboratory settings, and provision is also made for experience in training local school personnel and working with parents. The second year of the program consists of an internship in a Vermont school district. Trainees are responsible for working with teachers and parents, for developing programs for eligible children, for conducting workshops for school personnel, and for participating in university seminars. Each trainee serves about 30 children in meeting the training objectives during the two-year program, with supervision of trainees dimensioning over the course of the second year.

CBTE Criteria

The program displays a number of CBTE characteristics. Consulting teachers are evaluated on the basis of their mastery of the minimum training objectives developed by the special education faculty. In addition, behavioral techniques are applied which require a precise record of the techniques employed, and this record serves as an immediately available evaluation of the students' effectiveness in accelerating the progress of eligible children.

After formal course instruction, trainees are required to demonstrate integration of knowledge and skills, emphasizing observation and measurement of classroom behaviors, by application of techniques of applied behavior analysis to at least one eligible child. Course work is, to some extent, modular and self-paced. Trainees are accountable to the program and to parents, teachers, and others through the requirement of written evaluation reports which trainees prepare concerning the individual instructional program and the child's progress.

Program Evaluation

The Consulting Teacher Program began during the 1968-69 school year. Each year, eight certified and experienced teachers were non-randomly selected to participate in the program. Sixteen teachers are expected to be recruited in the 1976 school year. The trainees' consulting performance was evaluated in terms of specific performance gains of their pupils. Analysis consisted of descriptive data.

Each trainee defined for each of his/her pupils a target behavior requiring intervention, the learning conditions under which this behavior occurred, and measured behavior change during intervention. Baseline and performance data were measured using time samples, frequency counts, percentages complete and correct, and rate.

In addition, each trainee was evaluated by a study committee using a criterion-referenced measurement to show attainment of specified competencies.

All trainees participating in the program have shown positive results with their pupils and have completed the program with certification. Follow-up recommendations for children served are made until stated instructional objectives are achieved, according to the "zero reject model." Because of the program's success, it was continued and extended in 28 of the 53 Vermont school districts as of 1975-76.

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Project: The Rutland Center Developmental Therapy Model: A Model Program of Teacher Training and Service for Children with Severe Emotional and Behavioral Problems

Director: M. M. Wood*

Location: University of Georgia, Athens, Georgia

Program Description

The Rutland Center Project is a combined teacher training model and an educational delivery system for children (ages 2 to 14 years) with severe emotional and behavioral problems.

Included in the Rutland Center-Developmental Therapy model are: (a) a social-emotional curriculum for emotionally and behaviorally disturbed children which uses normal developmental milestones as a guide to teaching objectives; (b) a performance-based team teaching model; (c) an evaluation system, criterion-referenced to Developmental Therapy, in which trainees learn to evaluate a child's progress in the developmental curriculum; (d) a series of audiovisual training packages which enable trainees to learn the model at their own pace and away from the training center facility.

The program has been supported since 1970 by the U.S.O.E., BEH, as a model demonstration preschool program, and by the Georgia Department of Education. The program has been replicated by 22 school systems in Georgia and eight sites outside of the state.

Teacher training and pupil service are carried out at the Rutland Center facility. A maximum of 13 trainees is served each quarter. The training program is implemented through a three-person team with specific roles assigned to each team member. Each team works with a group of up to eight children, grouped according to a common developmental stage. Each team member is assigned a role based on defined and specified entry skills necessary to fulfill the role. The three roles are: support teacher, lead teacher, and monitor/parent worker. The support teacher must have demonstrated mastery of the AV training program. The lead teacher is experienced in implementing Developmental Therapy, and the monitor must have classroom competence in both the lead and support positions. The monitor functions to provide feedback to lead and support teachers and is responsible for parent and classroom teacher contacts and other leadership activities.

Individual roles may be rotated for different treatment groups and at different stages of Developmental Therapy. For example, one staff member may be a lead teacher for a Stage III class in the morning and serve as a monitor for a Stage II class in the afternoon. Rotation of roles also occurs every 10 weeks when children are reevaluated and regrouped according to mastery of the Developmental Therapy objectives.

Staff selection is based on successful completion of the Rutland Center AV Training Program and mastery of the Developmental Therapy techniques at the support teacher, lead teacher, and monitor levels.

CBTE Criteria

As can be inferred from the program description and the evaluation information that follows, the Rutland Center Program fulfills all major CBTE criteria to a large extent. The basis of competencies is both authoritative and empirical, the latter reflecting program modifications from feedback of evaluation data. Most competencies are specified in behavioral terms and all are made public. Assessment is competency based, with mastery levels specified and public. Progress through the program is based on demonstrated competency (pupil progress), rather than temporally determination. Other CBTE criteria; e.g., individualization, feedback, systematization, and modularization are also present, as is student accountability to the program, teaching team and pupils. The program is field-centered, the trainee is involved in decision making as a member of the teaching team, protocol materials are used in training, and the program has an active research component.

Program Evaluation

The program evaluation system is described by C. Huberty and W. Swan (Wood, 1972) and by W. Swan and M. Wood (Wood, 1975). Evaluation is seen as an integral part of the project rather than adjunct to it. The evaluation procedures function as an information system for decision making in all areas of center services: service to children, service to parents, communication and technical assistance, and administration. The information used in each program component is in the form of data which provide description and judgments of program antecedents, transactions, and outcomes, as well as contingencies, among these. The evaluation paradigm is partially adapted from Stake (1967).

The evaluation plans do not include comparative assessment of treatments or curriculum. A rationale and discussion are offered for evaluation by description and observation of individuals and/or small classes, rather than by experimental, control group designs:

> The aim to compare one program with another should not dominate plans for evaluation; evaluation should be primarily concerned with efforts of the program under study. Rutland Center effort is addressed to the question, what changes can be attributed to an involvement in a certain kind of program intervention (Huberty & Swan, 1972, p. 25).

Determination of objectives within each of four major curriculum areas (Behavior, Communication, Socialization, and Academics) is the basis of grouping pupils and setting individual and group objectives. The Developmental Therapy Objectives Rating Form (DTORF), containing 140 Developmental Therapy objectives hierarchically stated in the four curriculum areas, is used for pupil assessment and design of pupil objectives. The DTORF records both "developmental milestones," i.e., pupil objectives mastered, and those objectives to be the focus of the next treatment period. The initial administration of DTORF provides the base-line indicators of the pupil's developmental stage, and provision is made for reassessment of the pupil on the DTORF at the end of each five week treatment period. By concensus, the three person treatment team rates the pupil's mastery of each of the DTORF objectives, and formulates new objectives based on these data. Inter-rater reliability estimates range from .59 to .99.

Observation data are also collected by program evaluators through use of the SWAN system (Huberty and Swan, 1972). It is composed of 8 major and 16 minor categories criterion referenced to subsets of the objectives specified in Developmental Therapy. Observation via one way vision observation rooms is employed. Inter-rater reliability was reported to range from .70 to .97. The SWAN data are used by the treatment team in weekly debriefing sessions.

While the documents upon which this summary is based did not report program evaluation data, the extensive evaluation data collected on individual pupil growth for feedback and planning purposes have been summarized and a statistical analysis of the total program is in progress (personal communication with M. W. Wood, Project Director, March 1975).

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Project: The Seward-University Project: A Cooperative Effort to Improve School Services and University Training

Director: Stanley Deno*

Location: University of Minnesota, Minneapolis

Program Description

The purpose of this project was two-fold: (1) to develop a non-categorical special educational service system in the regular school and (2) to offer practicum experience and training to preschool and inservice teachers. The target pupil population consisted of all handicapped children in the Seward Elementary School. The project was designed to avoid labeling any of these children and to provide them with appropriate educational interventions within the regular classroom whenever possible.

The focus of the project's research was on the development of the skills and knowledge necessary for implementing the service system. This included training in discrepancy measurement, precision teaching, and inservice training. The time of program involvement for most participants was not indicated. Some practice continued for a quarter; other teachers participated in the program for a minimum of one year. The project was initiated in the fall of 1971 and was expected to continue at least into the 1973-74 school year.

CBTE Criteria

According to Deno (1973), the purpose of the Seward-University Project was to improve both the quality and quantity of special educational service available to children at Seward Elementary School. The project was also designed to increase both the opportunity for, and the effectiveness of, preservice and inservice education of teachers. In return for providing resources to assist in the development of a special educational service center at Seward School, the University was provided space to organize preservice and inservice practicum opportunities for teachers.

The program can be described according to a number of criteria essential to competency-based teacher education programs. Project goals, objectives, and procedures were developed in accordance with the perceived roles of the consultant, teacher, diagnostician, and team planner in a non-categorical special education system. The objectives were stated in behavioral terms and made public to those involved in the project.

The participating preservice and inservice teachers who undertook practice at Seward were assessed primarily in terms of their pupils' performance. Modification of a referred pupil's individual program was based on measures of discrepancy between minimum acceptable performance and actual pupil performance. The pupil's progress was continuously monitored, and a time series record of his/her performance (daily, weekly, and monthly) was prepared by the teacher. Each practicum teacher on trainee made case presentations at least once a week using the discrepancy graphing system (the time series record). This provided the trainees with opportunity for evaluative feedback and suggestions from both supervisors and peers. Accordingly, the practicum trainees developed behavioral objectives for their pupils and charted their behavior. The trainee assessment procedure was based on pupil performance; it specified mastery levels and accounted for the pupil's acquisition of knowledge, social behaviors, work habits, or whatever target behaviors were originally specified.

The participants' progress through the program was based on both their demonstrated competencies and the completion of the practicum period.

In addition to the aforementioned elements, the Seward-University Project incorporated several other features which are characteristic of CBTE programs. Feedback was provided daily through the charting procedures and weekly through trainee presentations of charts. Training occurred in the regular classroom setting, and participants were encouraged to participate in overall program decision making, along with all other members of the school staff and the university coordinators.

Program Evaluation

The Seward-University project was designed as a time series evaluation. The participating trainees were evaluated in terms of the progress made by their pupils. Thus, the single unit of analysis in this case was the individual pupil. Trainees selected pupils for educational intervention, placed them in appropriate classrooms, developed an individual instructional program, and continuously monitored each pupil by graphing performance/discrepancy data which resulted in a time series record of individual pupil performance. If the child's actual performance coincided with the desired performance (established by resource teachers through interviews, analysis of curriculum requirements, and classroom observation), the educational strategy was continued. If not, program modifications were developed.

The total number of participating practicum teachers was not indicated. However, it was noted that the number of trainees per quarter ranged from two to six. Trainees were selected by the various training programs in special education.

Two sources of data were utilized in the evaluation of the Seward-University Project: pupil performance records and surveys completed by program participants and non-Seward practicum teachers. Complete pupil records on intervention results for 14 pupils during the 1971-72 school year indicated that the post-intervention yearly progress rate ranged upward from a minimum of 33 times the pre-intervention rate.

The survey questions were based on the original program objectives and, essentially, asked if the practicum teachers felt they had been offered the specific services. Seward participants responded highly positively: 100% yes on all questions, while non-Seward practicum teachers responded very favorably from 28-60% of the time.

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Project: The Mark Twain Teacher Internship Program for the Preparation of Personnel in the Education of Adolescents with Special Needs

Director: S. Fagen*

Location: Montgomery County School District, Rockville, Maryland

Program Description

The Mark Twain Internship Program, established in Montgomery County, Maryland, was developed as a public school alternative to graduate teacher training. Implemented during the 1972-73 school year, the program serves the Mark Twain School and student resource room in other schools in the county. The Mark Twain Internship Program combines staff development with service to adolescent pupils experiencing learning and/or emotional difficulties. Depending on severity of problems, students attend either the Mark Twain School, an intensive, short-term special day-school, or receive supplementary services from a school-based resource center (a high school, junior high, or middle school program). A teacher trained in the program is competent to teach LD/ED adolescents in any of a number of educational settings comprising a continuum of services.

The focus of the program is on the trainees' development of specific knowledge, attitudes, and skills in five teacher competency areas. The program consists of seven full day sequences conducted over a 41 week span. Training occurs at both the Mark Twain School and in school-based resource centers. Instructional methods include seminars, practice, and individual projects.

CBTE Criteria

This program includes most of those elements designated as essential to competency-based teacher education programs. Competency area coordinators have specified five learning areas: (1) psychoeducational assessment and programming, (2) human relations and counseling, (3) curriculum development and implementation, (4) behavior management, and (5) school analysis and consultation. These five areas are organized in terms of 15 subcompetency statements and based on priorities generally recommended in the literature for teachers of special children. Each of the 15 subcompetencies is defined by statements of specific performance objectives which, in turn, are further described by statements of behavioral objectives. (An exception is in the area of curriculum development and implementation, where behavioral objectives are not yet available.) The training program is comprised of an integrated schedule of seminars, practice, and individual projects covering a core set of objectives and designated electives, presented to the trainees in advance of instruction.

At the performance level, interns are allowed to recycle tasks as often as necessary until an adequate level of performance is reached. At the subcompetency level, the intern is evaluated by means of a weighted integration of ratings from practice and seminars. First, each competency area coordinator rates each intern on a 7-point scale (needs strengthening - effective - highly effective) for each subcompetency in his/her area. Results are based on performance to explicit criteria, as well as unstructured observations and teacher-made tests. In addition, at the end of each practicum placement, the supervising teacher rates the intern on the same 7-point scale for each subcompetency s/he felt the student had opportunity to demonstrate. There are three practica resulting in three evaluations. Clear criteria for levels of specificity of the performance and behavior objectives are only partially developed, although these criteria are made public to the interns in advance of evaluation dates.

In addition to evaluating the interns' knowledge and skills, an attempt was made to assess the impact of the program on the interns' attitudes and values. Pre- and posttests were administered (including the Minnesota Teaching Attitude Inventory, FIRO-B, Personal Orientation Inventory, Teacher Practices Questionnaire, Profile of Organizational Characteristics, Problem Behavior Analysis, Specialized Proficiencies for Working with Exceptional Children and Qualification and Preparation of Teachers of Exceptional Children). The Wilcoxon Matched Pairs Signed-Ranks Test was used to determine statistical significance of differences between pre- and posttest attitude scores. These lists were submitted to outside experts for evaluation, and several were found to be inappropriate. Generally, it was concluded that variables measured were poorly defined, error of measurement was large, and the small sample size affected the validity of results. Also, it may have been unrealistic to attempt to measure attitude change in a selected group with high incoming levels of the valued attitudes. A statistically significant increase in trainees' confidence in their valued competencies was apparent on six of the seven sections in the specialized proficiencies scale. No differences occurred in intern ratings on importance of these proficiencies.

The competency area coordinators held weekly meetings to review and revise the curriculum. Both practicum supervisors and interns rated the importance of each competency and subcompetency as perceived in relation to their needs. The interns completed the program when they attained an overall rating of "effective" or "highly effective" in each of the 15 subcompetency areas.

Each intern (1973-74) was required to attend five seminars, one in each competency area. Also required were 900 hours or 14 credit hours of practica conducted in three different settings. Interns rotated through two 7-week practica in the fall, one at the Mark Twain School and one at another school-based program. The third practicum was a 16-week, full-time experience in the spring semester, arranged on the basis of individual interest and specific training needs. Finally, each intern was required to complete two individual projects. Elective projects were offered in each competency area as well as in cross-competency areas. The program, then, was partially individualized for the trainees.

Feedback is an important element in the program. In the 1973-74 schedule, there were seven learning sequences, four of which involved review and evaluation. The students also received three reports (the 7-point rating scale) during the year of progress toward meeting program objectives. In addition, weekly feedback from and to interns on program implementation and progress was accomplished verbally or in writing. Feedback resulted in continuous modification of schedules, requirements, and instructional format.

The project's purposes, goals, and subgoals were presented in the original program proposal, and the competency areas and their objectives were developed as interrelating components to work in a systematic, integrated fashion to attain those goals. The project emphasizes the outcome behaviors of the interns--when they have achieved effectiveness in each required competency, they have attained their goal.

The authors report that the curriculum is being organized into packets containing objectives, sequenced instructional units, learning activities, resource materials, and evaluation activities and criteria.

Staff involved in the development, implementation, evaluation, and revision of the program's objectives, curriculum and assessment procedures include: Mark Twain School and other school-based personnel, public school resource persons, outside consultants, area specialists, past interns and present trainees.

The Mark Twain program is classified as an internship program rather than a university preservice program. Each of its graduates receives 32-34 hours inservice credit and special education certification in the state of Maryland.

Program Evaluation

Teachers applying for the Mark Twain Teacher Internship Program are subjected to a rigorous selection procedure. The actual selection process consists of two phases. Phase I is a review by a selection committee of (1) the applicant's personal folder, (2) the Mark Twain Supplementary Application Form, (3) personal references, and (4) group interviews. Phase II involves an intensive personal interview. This process resulted in the final selection of eight trainees in each of the two years. All of these interns had at least a B.A., and by 1973-74, there was an additional requirement of a minimum of two years teaching experience. These trainees all completed the program. The directors chose to maintain these high selection standards because of the demanding nature of the program. Several applicants dropped out each year (6 out of 21 in 1972-73 and 9 out of 27 in 1973-74) either because the program did not offer them sufficient finances or because it did not award an M.A. degree.

The eight-member trainee group was the single experimental group under study each year. There were no control groups. Using a 7-point scale, the interns completed a self-evaluation of their attainment of specific competencies both pre- and post-training and provided reflections on their experiences. The median ratings for intern pre-post training self-evaluation of competencies showed increases of 1 to 4 points per item. Self-reflections indicated trainees' increased feelings of professional competence, self-confidence, and self-awareness.

In addition, the interns were pre- and posttested using questionnaires and rating scales to determine the impact of the program on their values and attitudes. The interns also received three specific evaluations during the year from competency area coordinators and from their practice supervisors. Evaluation measures included criterion-referenced measurement questionnaires and an observation rating scale.

According to the final evaluations and the interns' self-evaluations, the trainees did successfully master program competencies. However, selected measures of attitudes and values did not show any significant change in the importance attributed to these specific attitudes and values by these teachers during the training program.

In this program, the trainees were observed at the practicum sites in interaction with selected pupils. They were rated on their teaching performance in terms of the specific subcompetencies required, but there was no assessment of pupil performance as an outcome of teaching.

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Project: The Houston Plan: Retraining of Regular Classroom Teachers to Work With Handicapped Children Within a Regular Classroom Setting

Director: C. Meisgeier

Location: Houston Independent School District, Houston, Texas

Program Description

The Houston Plan was a comprehensive training and service delivery system in which the retraining of regular teachers was only one component. This project and the specific training program outlined here were sponsored by the Houston Independent School District. The fundamental premise of the project was that all children deserve a special education. The traditional category system for funding and placement was eliminated, and attention shifted to the identification and development of personalized instructional programming for all children by teachers who had completed the re-education program. Multiple placement options were available for any given child, with a general de-emphasis on self-contained classrooms for the children traditionally referred to as handicapped. The Houston Plan, with its Teacher Development Center concept, made use of "Behavior Skills Labs" and had two elementary schools and one high school specifically allocated for training purposes.

The trainees participating in the Houston Plan re-education training used protocol and other training materials while at the Teacher Development Center. Field-centered training activities occurred in demonstration schools and in the trainees' own schools.

The training activities for any given trainee comprised a two-week work period (120 hours of training) with a one-week follow-up. The trainee participated in activities at the Teacher Development Center, the Houston Plan demonstration schools, and his/her own school. A total of 1140 regular teachers were scheduled to cycle through the Teacher Development Center in September, 1972, with comparable numbers to cycle through in later sessions until all teachers in the district had completed the training. It was projected that, for every 510 regular teachers, 1500 former special education students would receive personalized programming as a result of the retraining.

CBTE Criteria

The Houston Plan incorporated many of the CBTE elements into its program. Teaching competencies were role-derived, specified in behavioral terms, and made public. The objectives were expressed in terms of both knowledge and performance criteria. One example of Houston Plan objectives based upon knowledge criteria is: "The trainee will be able to identify and list three categories of reinforcers." An example of an objective based upon performance criteria is as follows: Given a class of children the trainee will set up an indirect reinforcement system which includes the following: (a) behavior trainees will reinforce, (b) incompatible behaviors the trainee will punish, (c) reinforcers available, (d) two schedules of reinforcement, (e) indirect reinforcers, (f) three week chart which includes one week of baseline and two weeks of intervention (select two criteria).

These examples indicate that assessment criteria were competency-based and that specific mastery levels were required of trainees. These CBTE elements were known to trainees prior to training, but information about actual assessment procedures and/or policies, e.g., the evaluation process, was not outlined.

Neither the nature of decision-making activity in relation to training material selection and evaluation nor the role of trainees in the decision-making process was indicated; however, the emphasis placed on a multidisciplinary service delivery system suggests a broad-based approach. A service orientation rather than a research orientation was inferred from available information.

Progression through the training program seemed to be fixed in terms of real time--two work weeks and one week of follow up--but progression for the individual trainee within these real-time limitations was flexible and personalized. The instructional program itself was delineated in terms of project training objectives, core performance objectives, and content objectives (acquired in the Behavior Skills Labs). Trainees, having completed the content and core performance objectives, were expected to return to their schools and complete project training objectives. An example of a project training objective follows:

> Each regular teacher will be able to plan and develop individual student programming through at least four classroom learning center activities during the school day. This objective includes the preparation of instruction for at least three previously labeled special education students. (Meisgeier, 1973, p. 80)

The Houston Plan for retraining regular teachers incorporates many of the implied CBTE characteristics. Individualization was achieved most directly when the trainee returned to his/her school to act as a change-agent. Feedback, a central component of the entire training process, was implemented by the project staff who followed-up trainees in their "home schools." The training objectives of the Houston Plan suggested both a systematic approach to the retraining of regular teachers and an emphasis on exit requirements. Modularization was best reflected in Behavior Skill Lab activities.

Program Evaluation

Although the Houston Plan for retraining teachers was a high-volume program which involved the recycling of large numbers of teachers through the Teacher Developmental Center, no evaluation data were reported in available descriptive material.

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Meisgeier, C. The Houston plan: A proactive integrated systems plan for education. In E. N. Deno (Ed.), Instructional alternatives for exceptional children, Reston, Va.: Council for Exceptional Children, 1973.

Project: Dissemination of Mental Retardation Services and Treatment Through Recruitment and Training of Rural Teachers

Director: J. G. Morrey

Location: Child Development Center, University of Idaho, Pocatello

Program Description

Idaho is a state with a dispersed rural population. The focus of this project was upon training regular, inservice teachers in rural areas to provide effective instruction for mentally retarded children within regular classrooms. The content focus of the project suggested a diagnostic-prescriptive teaching approach. Each teacher was expected to complete the training project with a specific set of generic skills related to individualizing a child's program, conducting small group instruction, and working with parents and administrators.

The focus of the training involved both knowledge acquisition and skill development, which were subsequently integrated during direct interaction with specific children. These self-contained training activities occurred both in a lab classroom and in formal seminars. The training involved an eight hour day for five weeks; all but 1½ hours per day were spent directly in lab classrooms.

CBTE Criteria

This project appears to have had all the essential elements of a CBTE program. The bases for competency selection were authoritative sources and these were indicated in the project report. Competencies were publicly stated and specified in behavioral terms.

Assessment criteria were competency-based in terms of criterion-referenced tests that the teacher had to complete daily. Teachers performance in lab classrooms was not directly evaluated, but teachers were required to document their own activities in the classrooms and to chart the progress of individual children. Mastery levels were indicated only for the criterion-referenced tests. Trainees were not evaluated in terms of pupils' progress. Each teacher was required to complete a criterion-referenced test daily before beginning readings/activities for that day. This entry performance was subsequently compared with a posttest completed at the end of the day. Unsatisfactory performance on this second test required the teacher to recycle on specific material.

Progression through the training program involved block instruction in seminars and completion of identical objectives by all participants. However, each teacher had an individualized practicum experience which corresponded to group objectives. This was a very intensive short-term program, and all teachers were expected to finish in the allotted five weeks.

Implied CBTE criteria were also fairly well representative of this project. Teachers received daily feedback on their progress from results on the criterion-referenced tests. Progression through the program was systematic; direct interaction with and responsibility for instruction of children increased over time.

Two kinds of accountability information were indicated. Upon completion of the requirements, teachers were asked to evaluate the project. The number of pupils and parents receiving direct or indirect services as a result of this project was reported. Fifty-eight preschool children (direct contact), 61 parents (periodic contact), and 40 elementary level children (consultant service) were served by the seven project graduates who functioned as change agents in their local districts. In addition, project personnel remained in contact with these teachers to provide additional assistance and receive information concerning continuing needs.

The project was not field-centered, but the evaluation was. Information related to the base for decision making was not indicated. Project participants did use a specific set of training materials but did not use protocols. Teachers did not appear to have an active role in decision making, but their responses to end-of-project questionnaires were considered in content/sequence modifications.

Program Evaluation

Teachers were evaluated on their knowledge of training content on criterion-referenced tests given daily. They were selected on a non-random basis according to the following broad criteria: (a) experience or training in education; (b) indication of interest in helping handicapped children, ascertained during a personal interview; (c) residency in an area where a change agent/program expansion was projected; (d) willingness to work for the Child Development Center. Documentation on pupil evaluation data was not included in the report, but teachers were responsible for planning, implementing, and reporting pupil progress during training.

Data analyses were descriptive (indication of percentages of accuracy on criterion-referenced tests): no reliability information was reported. The only instrument used, other than the criterion-referenced measurements, was the opinion survey given to teachers following training.

The independent measure was the training program, and the dependent measure was trainee groups performance on tests. The training cycle was instituted three times. During the first cycle three trainees participated in and completed the training program. Another three trainees completed the program during the second cycle. Only one teacher was trained during the third cycle. In the first cycle, 83% of the criterion-referenced tests had to be taken a second time for teachers to achieve 90% accuracy. By comparison, with the second cycle of three teachers, only 22% of the test had to be taken a second time to achieve 90% accuracy.

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Project: EMR Program Development: ESEA Title III, Ohio's "HELPS"

Director: J. Noffsinger and J. Daiker*

Location: Dayton, Ohio

Program Description

Ohio's "HELPS" (Ohio's Handicapped-Education-Learners' Planning System) is a state-wide computer managed special education pupil resource and teacher training system. It is composed of four computer-based subsystems: The first two are devoted to improving pupil instruction (a) through a data-base of group instructional modules adopted from the Computer-Based Resource Units System (CBRU'S) developed at Buffalo, N.Y., and (b) through a data-base of objectives for individual pupil planning, available through the Persisting Life Problems Curriculum-Learning Resources file.

The other two subsystems are devoted to improving the instructions of professionals. The third subsystem is the Competency-Based Inservice Teachers Training System (CBITTS), which can be adapted for preservice training by universities. The information and modules contained in CBITTS are retrieved through the Teacher-Competency Learning Resource file which generates lists of learning resources for inservice training. Over a two-year development period, regional committees have identified competencies for inservice training and have developed a set of descriptors for entry into the system. The fourth subsystem is the set of competency-based training modules for curriculum consultants that comprises the SECTraC program (Meyen, Altman, Chandler, 1973). An increasing data base of relevant training modules and materials has also been incorporated into the system.

CBTE Criteria

The HELPS Project was designed as a CBTE program. While the primary focus up to now has been on rapid retrieval of resources for special education pupil planning, the training materials available in the system are modular. The system should eventually be capable of generating individualized sets of teacher training materials and modules.

Program Evaluation

Evaluation of eight training modules was undertaken during the 1974-75 school year. Committees made up of university faculty and supervisory personnel selected topics for the development of modules and, in the process, were instrumental in identifying the criteria for developing a module on "module design" which utilizes the data and resources available in the system. Approximately 50 teachers participated in this initial evaluation trial of the system. Data were collected on teacher knowledge acquisition, and pupil change scores were obtained for five of the eight modules.

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Project: Training Model for Cooperating Teachers in Special Education: Mental Retardation

Director: J. D. Strauch*

Location: University of Connecticut, Storrs

Program Description

At the outset of the project, a three-week summer conference was held for cooperating teachers, school administrators, student teachers, and university faculty. The 25 workshop participants generated a list of role expectations which served to point out discrepancies in perceptions of the student teacher/cooperating teacher roles. A set of cooperating teacher competency statements was also developed from the role definition process and subsequently became the basis for a survey of competency ratings by teachers, student teachers, and trainers.

Teachers selected for training were experienced special class teachers, recommended by principals. About half of this group had previously served as cooperating teachers.

Over the three-year span of the project, 50 cooperating teachers were trained. During the first year, 15 teachers participated in 13 day-long workshops held during regular school hours. In the second year, 10 cooperating teachers met after school hours for 10 sessions, each of which lasted 4½ hours. Training time was further reduced in the third year, when 25 teachers participated in one workshop which lasted four hours. By the third year, cooperating teachers were provided with additional self-instructional materials that had been developed during the previous two years.

There were five major objectives for the overall project, and each objective was implemented with varying degrees of emphasis over the three year period. The project objectives were as follows:

1. Develop a pool of competency statements or functions of cooperating teachers.
2. Delineate roles and expectations for student teachers, cooperating teachers, and college supervisors as they are perceived by these groups.
3. Train teachers to identify, write, and utilize behavioral objectives.
4. Train teachers to observe and record selected teaching behaviors.
5. Train teachers to use rating scales for feedback to student teachers.

CBTE Criteria

The basis of competency selection for cooperating teachers was a survey of teachers, student teachers, and trainers. Training objectives were specified in behavioral terms, and in fact, a major portion of the program was devoted to training cooperating teachers to use and write behavioral objectives. Assessment was performance based and involved the use of observation instruments by cooperating teachers. Cooperating teachers also provided feedback to student teachers by means of rating scales.

The project was almost entirely field-centered, provided for input from both teachers and student teachers and protocol and training materials were used in training workshops. The program manifested a research orientation and a number of program modifications were based on the evaluation data obtained the previous year.

Program Evaluation

The competency phase of the project produced a set of cooperating teacher competency statements that reflected the judgments and priorities of students, cooperating teachers, and teacher educators. Various studies of the remaining goals were conducted, and the evaluation design changed according to the year of the project and the specific objective being evaluated.

Attainment of the objective "identify, write, and utilize behavioral objectives" by the first-year group was evaluated by means of paper and pencil tests. A pre-post study found that 13 of 15 teachers improved in these competencies as a result of workshop participation. Second-year teachers were required to utilize behavioral objectives in two curricular areas (reading and math) for two pupils in their classes. A mean success rate for all 10 second-year teachers was reported. Measures of the success of implementation of objectives were criterion referenced and based upon pupil achievement. Eight of 10 third-year teachers achieved criterion performance on a final test after completing an instructional module on writing behavioral objectives.

Evaluation of the training program was conducted by means of Likert scales on aspects of teacher and student teacher satisfaction with the program and its perceived value to the individual. In comparing project with non-project (contrast) teachers on specific performance tasks and on perceptions and judgments (concerning university supervision, evaluative conferences, etc.), the project teachers tended to score higher, though not significantly so, in most instances. Likewise, student teachers of project cooperating teachers perceived their teachers and their experiences more positively than student teachers of non-project cooperating teachers, but, again, not significantly so. Open ended questionnaires and general evaluative comments submitted by program participants indicated that the trainees were satisfied with the workshops and believed that the total program had been beneficial to them as cooperating teachers of special education students.

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Strauch, J. D. Training model for cooperating teachers in special education: Mental retardation. Final Report, Washington, D. C.: U.S. Office of Education, Bureau of Education for the Handicapped, 1974, OEG-0-71-4138 (603).

Project: Special Education Microteaching

Director: T. M. Shea*, W. R. Whiteside, E. G. Beetner, and D. L. Lindsey

Location: Special Education Microteaching Clinic, Southern Illinois University, Edwardsville

Program Description

In this project, microteaching procedures were adapted for a special education teacher preparation program and a microteaching clinic was established. Project development included: (1) training of a microteaching staff, (2) design and production of modeling tapes, and (3) scheduling of special education trainees into the microteaching as a content coordinated part of their course work. In the first phase of the program, trainees participated in a weekly series of 60 minute microteaching cycles (teach, critique, plan, reteach and recritique). Microteaching was conducted at the clinic and lessons were taught to peers. In the second phase of the program, microteaching was conducted in special education classes in the local schools.

The microteaching modules developed at SIU-E vary in length from 6 to 25 minutes and trainees take up to one hour to complete the cycle. Prior to microteaching, the trainee receives instructional materials concerning the topic of the lessons to be taught, views the modeling tape, and discusses the lessons with a "critiquer." The trainee then teaches the lesson to two or three peers. The critiquer observes and evaluates the trainees' performance using an evaluation checklist specifically designed for the given minicourse. Criterion performance is specified on each evaluation checklist. The trainee and critiquer then view the videotape playback of the lesson and discuss the trainee's performance and evaluation checklist outcome. If the trainee's performance is unacceptable, the trainee recycles through the minicourse until criterion performance is reached.

Since the critiquer is a key figure in the microteaching process, provision is made for training of microteaching staff. The critiquers are graduate students with "varying degrees of training and experience with handicapped children" (Shea, Whiteside, et al., 1974). Each critiquer attends a 30-hour workshop prior to joining the microteaching staff.

CBTE Criteria

The use of simulation and minicourse instruction is a common training feature of CBTE programs. Extensive development effort was expended in the production of the modeling tapes and accompanying instructional material. The modules are exportable and have been made available for dissemination.

Each minicourse was accompanied by a trainee evaluation form, and the trainees' ratings became the basis of subsequent revision of the minicourse. Competencies taught were selected by training faculty, and progress through each minicourse depended upon demonstrated competency rather than time.

Program Evaluation

Over a three-year period, half the special education students at SIU-E received four hours of lecture and four hours of microteaching per week. The other half received four hours of lecture and four hours of participation in a special class. All students were evaluated during student teaching for acquisition of the skills associated with the microteaching lessons.

Twenty different instructional modules were produced which included: video modeling tapes, written protocols, and performance evaluation instruments. Over the three-year period of development and evaluation, 757 trainees participated in the microteaching program. Five hundred forty-four were trained on campus; 213 participated in the local schools.

Two studies were conducted. The first examined the effect of viewing (or not viewing) a modeling tape prior to microteaching. Significant differences ($p > .05$) between means were obtained by the t-test for 6 out of 69 minicourses. In 5 of the 6 cases, the differences were in the expected direction (favoring prior viewing of the model tape); in the other case, absence of the model tape was found to be superior to viewing the tape. All teaching performance was rated by critiquer (no reliability data provided). Each trainee was permitted to work to criterion performance. The performance differences analyzed were the trainee's first microlesson for each minicourse. Each lesson used a unique rating scale and was therefore considered a separate experience. No comparisons were made across lessons (minicourses).

In a second study which compared the ratings obtained by trainees during student teaching, the microteaching group (N = 84) was compared with the participation group (N = 86) on a 30-item rating scale. The two groups differed significantly ($p > .05$) on 6 of the 30 items.

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Project: Habilitation Personnel Training Project

Director: G. M. Clark* and K. Edmonds

Location: University of Kansas, Lawrence

Program Description

This training project is a series of approximately 30 modules being field tested with both preservice and inservice trainee populations attending the University of Kansas and other institutions, as well as with inservice populations in local school systems in the Lawrence area.

Training modules prepare teachers, prospective teachers, and other interested adults in generic skills appropriate for working with exceptional adolescents. Trainees may serve as teachers for such students or as work-study coordinators. Although the training content is generally noncategorical, most trainees plan to work or do work with EMR adolescents.

Most of the training modules involve knowledge acquisition or skill development, but several recently developed modules focus on implementation objectives in which knowledge and skills acquired in earlier modules are integrated.

Training environments include the use of simulation, tutoring (one-to-one), and the natural classroom. The modules can be incorporated into university seminars or used in more independent contexts. Progression through modules is self-paced; not all trainees are required or expected to complete every module.

CBTE Criteria

Teaching competencies selected are derived from logic and the application of a systems approach developed by Budde (1972) of the University of Kansas. The resulting competency clusters are then broken down operationally into terminal, enabling and entry-level objectives. All competencies are specified in behavioral terms and are available for inspection by trainees before initiating work on any module.

Similarly, assessment is competency based and made public in advance of training. Mastery levels for competencies are currently fixed at 100%, but validation research is being conducted with experts in specific competency areas to determine realistic mastery levels for all competencies.

Assessment, i.e., test items, is generated following Bloom's taxonomy for levels of difficulty, to correspond to levels of the objectives. Entry level is accounted for through pretesting, and a trainee's performance on such a pretest determines which specific components of a module a trainee must complete. A trainee who tests high on any pretest, may also be exempt from the corresponding module. This does not include certain synthesizing objectives, for which there are no pretests. Progress through individual modules and series of modules are based on demonstrated competencies rather than time restrictions.

These modules can be described as meeting all implied and related CBTE characteristics, with the possible exception of the field-centered element. Only the implementation-related modules involve direct field-centered input. However, since many of the individuals participating in the field-testing of these modules are in actuality "in the field," this may be an arbitrary distinction.

Program Evaluation

The scope of evaluation is comprehensive and an integral part of the entire module development cycle. For example the context for evaluation has included the use of symbolic, simulated, controlled and natural evaluation paradigms, and all pre-post assessment is criterion-referenced.

Small, controlled trainee populations have been involved in the field testing of these modules, and control groups have been included. The estimate of the total number is between 600 to 700. Effectiveness criteria are based on data related to trainee knowledge, attitude, and behavior patterns, but not in terms of environment change (i.e., pupil progress). Pupil validation groups have not been used, but, as indicated, adult validation groups are being employed to determine appropriate mastery levels for module competencies.

The basic design of trainee testing is a pretest-posttest paradigm, using paper and pencil tests. Rating scales and observation system are also used, but the contexts in which these instrumentation forms are used were not indicated. Inter-rater reliability for these latter forms of instrumentation has been estimated as .10.

Data analysis has been descriptive; the use of percentages has been the most frequent form of data presentation.

The independent variable is module-delivered knowledge and performance-based training; the dependent measure is trainee performance. Results have been positive.

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Project: The Special Education Curriculum Training Center (SECTrac), Project for Preparation of Curriculum Consultants

Director: E. L. Meyen, R. Altman,* and E. M. Chandler

Location: University of Missouri, Department of Special Education, Columbia, Missouri

Program Description

The SECTrac (Special Education Curriculum Consultants) project is a modular, competency-based program for the preparation of curriculum consultants. The development phase of the program consisted of the establishment of an empirical basis for the identification of competencies and the production of instructional modules. The modules were designed to provide trainees with the knowledge and skills required for competence in consultation relative to the development, evaluation and training of curriculum, instruction, materials, and support services. The skills developed were non-categorical and generic to a wide range of educational programs.

In order to obtain empirically derived competencies for training curriculum consultants, a survey study was undertaken. A stratified random sample of 720 regular and special education personnel in an 11 state area was sent questionnaires. Ratings were obtained of the importance and trainability of items in the questionnaire on the role of curriculum consultants for exceptional children. The result was the identification of 100 orthogonal competency statements, which served as the basis for writing curriculum objectives.

The 100 competency statements were rated according to their perceived importance by 587 field personnel. Each competency was rated on a 5-point scale and enabled the determination of the perceived relative importance of each item. Trainability ratings were also obtained. The majority of respondents viewed 76 of the competencies as primarily trainable through job training, 15 competencies primarily trainable through on-campus instruction, and 3 competencies as primarily the function of self-growth.

A panel of specialists in curriculum and special education was asked to apply a modified Q-sort to the 100 competencies. The results were used to organize the competencies into five function and five context dimensions. The five curriculum relevant functions were: evaluating, developing, training, advising, and serving as liaison. Each of these functions was seen as generic to the five contexts of curriculum, instruction, materials and media, communication processes, and support systems.

As a consequence of the clustering procedure, competencies were assigned to cells constituting a function-context matrix. Each of the function-context designations was identified as a potential module composed of from one to 11 competencies. Each competency component was then further reduced into two or more behavioral objectives. A typical module was composed of approximately five competencies, each competency was composed of about four competency components, and each competency component was composed of about four behavioral objectives. Thus, the typical module was composed of approximately 80 "functionally related behavioral objectives."

The modules were then produced and field-tested, and a training program was initiated at the University of Missouri, Columbia. The training program is offered on a degree or non-degree basis. A number of the modules are also integrated as course offerings in the special education graduate training program.

CBTE Criteria

The project was designed at the outset as a performance-based training program. The content of the modules is based on specific competencies identified through sampling expert opinion. The modules specify the settings for the development of competencies, some of which are university-based and others located in the field. Trainees are able to specify their own competency goals by selecting from among the available modules. All modules contain criterion-referenced assessments designed for trainee self-evaluation and pacing.

The modules have been designed according to a systems model, and each of the 13 completed modules includes the following elements:

1. Statement of competencies the module is designed to develop, the setting for completion of the module (i.e., field or campus), and time estimated for completion.
2. Statement of scope of the module and its relationship to overall program.
3. Competency components subsumed under the module.
4. Specific instructional objectives stated in behavioral terms.
5. The experiences, resources, and information required by the trainee to master the content of the module are detailed in the "teaching element" of the module. The information is organized in terms of instructional objectives with self-assessed criterion measures for trainee evaluation of achievement. A content plan is included which details activities, information, and assignments to be carried out in development of competencies.

A remediation alternative is available for trainees who do not meet criterion performance. Successful completion of all objectives in the module constitutes prima facie evidence of mastery.

Program Evaluation

Each module contains an Instructors Manual with provision for recording the evaluation criteria for trainee performance. Each trainee who completes a module has thus performed to criterion. No independent evaluation measures were applied, and no other level of program evaluation was contemplated in the design of the project. Thus, it is not possible to make any inferences about the transfer effectiveness of the training program. However, the program has strong face validity, in that the training objectives were empirically derived and materials were systematically field tested and modified during development.

The modules have been adopted by a number of regular and special education training programs and are currently available for continued dissemination.

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Project: A Two-Year Study of the Effects of a CBRU Workshop on Instructional Decision-Making

Director: D. Sylves* and J. Wolf

Location: State University College, Buffalo, New York

Program Description

This project was a two year study of the effects of a CBRU (Computer-Based Resource Unit) workshop on the instructional decision making of preservice special education trainees who were being trained to serve educationally handicapped children in unspecified locations. The six-week (3 hour per day for 30 days) workshop focused on general knowledge, skills, and attitudes believed to be important and relevant to the education of educationally handicapped children. Follow-up evaluation of the participants occurred during their student teaching situation in the following school year.

The rationale for this project centered on the notion that the actual process of developing a computer-based resource unit (CBRU) is, in itself, a valuable educational experience for preservice teachers. It was hypothesized that the following behaviors of workshop participants would be positively modified: (a) ability to identify and write behaviorally stated objectives; (b) ability to prescribe for given objectives, relevant instructional activities and materials which are appropriate to the student's individual difference; (c) an improved self-concept; (d) utilization in student-teaching assignments of materials, activities, and grouping procedures which indicate individualization of instruction; and (e) demonstration in student teaching of greater pupil participation as indicated by verbal interaction. These teaching competencies were developed as essential to the teaching of educa-

*Telephone communication 6/5/75

tionally handicapped children. They were specified in behavioral terms and made available for program participants.

The program covered a period of two years, and the assessment procedures were somewhat modified after the first year evaluation. In general, assessment criteria (made public) were based on specified teacher competencies. However, specific mastery levels, if required, were not indicated. In year one, written tests were developed to measure hypotheses "a" (write behavioral objectives), "b" (prescribe activities), and "c" (self-concept). A modified rating scale was used to evaluate teaching performance (hypothesis "d"). Finally, hypothesis "e" (pupil participation and interaction) was assessed by the FGESS modification of Flander's Interaction Analysis, Pre-, interim-, and posttests were administered.

In year two, the written tests were modified, the Perceived Individualization of Instruction Scale was utilized, written lesson plans were required and evaluated, and the FGESS modification of Flander's Interaction Analysis was used. Again, pre-, interim-, and posttests were administered. Assessment procedures for both years were performance-based and accounted for attitude changes and acquisition of knowledge.

CBTE Criteria

Participant progress through the program was determined both by demonstrated competencies and by course completion in the six week time period.

This program met the majority of criteria for a competency-based teacher education program. The program allowed for individualization, both in developing the CBRU components and, certainly, in practice teaching. Feedback was supplied through discussions, tests, and rating scales. However, it was not indicated whether the student and the program were held accountable for the student's demonstration of specified competencies before the student completed the program. Participation in both experimental and control groups was voluntary.

Although training was based at the University, extensive evaluation and trainee follow-up was conducted in the field. Decision making by program directors concerned the format and objectives of the workshop only. There was a great deal of student input into the actual process of CBRU development, and students determined the organization and content of the unit. The only constraint upon student input was the necessity of adhering to a computer compatible format.

Program Evaluation

In each of the study's two years, 30 exceptional education students completing their junior year were randomly selected for the experimental group and participation in the workshop. In addition, 30 other students in special education were randomly selected as the control group. Each trainee was administered pre- and posttests; the experimental group also took an interim test as a measure of immediate progress after completion of the workshop.

During the two years, participants' progress was assessed in terms of criterion-referenced measurements, including written tests, observation and attitude scales on individualization, and written lesson plans. Methods of analysis included multivariate analysis of variance, a matched t-technique, t-tests, and multivariate analysis of covariance.

It was hypothesized that participants would attain higher scores on measures of relevant cognitive content, on self-concept, on application of skills in a classroom situation, and on classroom verbal interaction. The results from year one and year two indicated that the experimental group scored significantly higher on the cognitive measures. The experimental group also tended to have higher means on the affective measures, although the differences were not always significant.

A student teacher rating scale and the modified Jason (a sign system observation instrument) scale failed to show significant differences in classroom application in year one. It was concluded that the lack of reliability of the untrained observers produced excessive error. Therefore, the year two study used written lesson plans and the Perceived Individualization of Instruction Scale (self-administered) for assessment, which resulted in the experimental group's scoring significantly higher than the control group on the classroom application variable.

The year two experimental group also scored significantly higher than the control group on the classroom verbal interaction variable, although these differences were not significant during the first year.

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Sylves, D. & Wolf, J. A two year study of the effects of a CBRU workshop on instructional decision making. Final Report, Buffalo, N.Y.: State University College, n.d.

Project: Computer Applications in the Field of Learning Disabilities

Director: J. Lerner* and J. Schuyler

Location: Northwestern University, Department of Communicative Disorders, School of Speech, Evanston, Ill

Program Description

This program was designed for preservice training of graduate students in special education. Its focus is the acquisition of knowledge and skills necessary in the diagnosis and remediation of learning problems in learning disabled children. It provides simulated experiences of clinical-teaching processes through the use of computer modules. The program extended over a period of four quarters or four 10-week units. Two courses were offered: (1) simulation of the diagnostic and clinical teaching process and (2) a computer course for specialists in learning disabilities and related areas.

CBTE Criteria

The authors of this program believe the primary aim of learning disabilities programs in universities should be training in diagnosis and remediation of children's learning problems. In line with this position, the specific objectives of two-year program were: (1) to develop interactive computer programs that would simulate the diagnostic and clinical-teaching processes and to implement such procedures within the curriculum of the learning disabilities program and (2) to develop a model for a course that would introduce the learning disabilities specialist to certain fundamentals of computer technology and to implement such a course within the learning disabilities curriculum. The program was intended as a bridge between and a supplement to the theory courses and practice.

The final report lacked sufficient data for a thorough evaluation in terms of criteria for competency-based teacher education programs. There was no information on whether the general objectives were defined and specified in behavioral terms or if these were made public before enrollment in the course. Little information on evaluation procedures is available. It is not indicated whether the assessment criteria were competency-based, whether specified mastery levels were required, or whether assessment procedures were made public. It was reported that in the clinical teaching simulation, trainees were evaluated in terms of how their teaching decisions compared with the responses of a group of staff and faculty in the clinics. A weighting system was developed, and the student was given both an overall score and a score (percentage) in each of seven areas. The student was also given the mean class scores and those of the faculty group for comparison purposes.

Evaluation of the overall program was obtained through attitude questionnaires regarding the clinical teaching simulation course and the computer course. These questionnaires were also completed by six local learning disabilities teachers and then several who attended workshops familiarizing them with the program as a validation group. These assessment procedures account for attitude change rather than acquisition of knowledge.

The trainees spend a specified amount of time with the computer and in class. Their progress through the program is based on course completion rather than demonstration of specified competencies.

There is some individualization in the training program. The computer feeds back information requested by the trainee. Thus different information may be supplied to different students working with the same "child." Also, each trainee independently designs his/her "child's" program. Feedback is continuously supplied by the computer, which answers the student's questions and also provides information about the progress of the "child." Feedback by faculty members is provided at the termination of the course.

Both the diagnostic-clinical course and the computer course are well modularized. The trainee can progress through the computer units at his own pace. However, it is not indicated whether the program accounts for the trainee's having successfully mastered the desirable competencies by completing all of the modules. There is student input through the evaluation procedure which provides the basis for program revisions.

Program Evaluation

The trainee group completed attitude questionnaires before and after training. In the clinical teaching course, an analysis employing a correlated t-test was performed on 19 cases to measure attitude changes regarding the use of the computer in teacher training and the understanding of the diagnostic-remedial process through computer simulations. In addition, a validation group of six learning disabilities teachers evaluated the program. A correlated t-test was also used in the analysis of 15 cases in the computer course. There is no available data regarding the procedures for selecting trainees.

The program's reported positive results indicated a significant change in trainee attitude regarding the usefulness of the computer in teacher training and the understanding of the clinical teaching process.

The course involves only simulated teaching experiences and at no time requires the trainee to perform before live students. Generally, the student must show that s/he understands the process of diagnosis and remediation of learning problems, though some specific teaching skills are included. The program directors did not intend for these two courses to replace either the theory or practicum requirements, rather the courses were intended to supplement these requirements and act as a bridge between them.

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Lerner, J. W. & Schuyler, J. A. Computer applications in the field of learning disabilities. Final Report, Evanston, Ill.: Northwestern University, Dept. of Communicative Disorders, School of Speech, August 1973.

Project: Methods and Materials Consultant

Director: D. Welch

Location: Olathe United School District, Olathe, Kansas

Program Description

The Educational Modulation Center, sponsored by the Olathe United School District, offered summer and academic year stipends to train in-service teachers as itinerant Methods and Materials (M & M) Consultant/Teachers. The students to be served are emotionally disturbed and/or learning disabled. Previous work with such children was desired of prospective trainees, although not necessary.

Teachers were trained to be consultants to regular teachers. The center's training orientation is the use of behavior modification with emphasis on the development of individualized instructional prescriptions.

The training format is a three-week workshop in which participants received course material related to the following areas: (a) specific diagnosis, (b) educational prescription, (c) orientation to use of prescriptive materials laboratories, and (d) behavior management techniques. The workshop is offered for three consecutive weeks in the summer or during three non-consecutive weeks during the school year. Trainees who elect the former training option are also assigned a practicum with an itinerant M & M consultant; the trainees who select the academic year trainee do not take a practicum. Thus, knowledge-skill integration is systematically controlled for summer trainees only, who work with M & M consultants assigned to teachers in functioning classrooms.

The program is independent of any university credit system, but teachers may apply to the University of Kansas for graduate credit on an individual basis.

CBTE Criteria

It is difficult to rate the degree to which this program is competency-based, because the focus of the available material was on the description of the service aspects of the M & M teacher role, rather than the character of training. Trainee's terminal competencies are specified in terminal behavioral terms, but criteria for assessment of performance of these or interim competencies were not indicated. Similarly, no information is available about related or implied CBTE criteria.

Evaluation

Comprehensive tracking of child progress is an integral part of M & M activities. It is used to assess the effects of M & M intervention in terms of the pre- and posttest performance of each child on four criterion measures--reading, arithmetic, spelling, and a teacher rating of the child's behavior. The use of pupil performance scores appears to be validation indices of the M & M training process.

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Discussion and Conclusions

Program Descriptions

The patterns observable in the training programs reviewed here suggest both common philosophical bases and also distinct administrative preferences and instructional orientations. These patterns are not unique to CBTE. They reflect trends also discernible in the larger special education community, e.g., mainstreaming, noncategorical training, diagnostic-prescriptive teaching.

Development of CBTE programs in many of the training institutions occurred at the undergraduate level, with expansion to master's level degree programs. An undergraduate program seems to permit more time to provide truly integrated training activities, to collect data for program revision, and to collect long-term follow-up data. Those graduate programs attached to universities with undergraduate programs, or those which allow more than one year for master's training, seem to be the most highly developed.

The number of inservice training programs sponsored by school systems is probably on the increase, particularly in terms of direct assistance to regular teachers with handicapped children in their classrooms. However, such programs have not been extensively documented or formalized and/or do not project a CBTE format. Those inservice programs included in this review appear to be well received by participants and very responsive to teacher needs.

The categories of pupils to be served, as well as the instructional setting in which they are found, suggest a high degree of commonality across programs and level of training. Trainees tend to receive noncategorical or cross-categorical training and are thus equipped to function in multiple settings. These factors complement the content focus of training, which most often takes the form of diagnostic, prescriptive/clinical teaching. Trainees typically are expected to acquire generic teaching skills within the context of field training, but also increasingly, through the use of minicourses and interactive modules, e.g., CATTS. Only two of the programs reviewed reflect a strong behavior modification orientation, but this may be due to selection bias.

Most programs include both knowledge acquisition and skill development objectives, but integration of knowledge and skills (e.g., coordination of course content with practica) is apparent in only about half of the programs reviewed. Lack of integration--the weakness most often reported by trainees and program directors--is also considered the most difficult weakness to eliminate. Programs most successful at integration have been those in which course work and practica occurred simultaneously, with course work complementing and supporting skills used while teaching. Typically, course work (knowledge objectives) precedes practica; skills develop in practica independent of course work.

Training environments usually include natural classrooms and, to a lesser extent, laboratory classrooms. Only two programs, Indiana and Northern Iowa, require trainees to work through a systematic gradation of instructional responsibility, i.e., tutoring, small group instruction, entire class. Course work usually occurs in seminars and, when associated with school-sponsored inservice training programs, often takes place in a teacher retraining center or school building rather than at a university.

About half of the training programs report using modules, but it is difficult to determine what portion of the program is modularized. Most programs which detail the content and sequence of their curricula support the modular approach but indicate that the time and effort associated with adopting a total modular format is prohibitive. For the most part, curricula information tends to reflect a format in transition between traditional course formats and legitimate modular formats.

Three programs report using workshops, but the functions of these workshops vary across the programs. At the University of Northern Iowa, workshops are used to orient cooperating (supervising) teachers to the undergraduate training program/procedures. The workshops at the State University College at Buffalo is a six-week program in which a curriculum unit for a competency-based retrieval unit is generated. The program at the University of Connecticut is similar but lasts over an extended period (42 weeks). The inservice project at the University of Connecticut was developed to train teachers to be effective supervising teachers. After-school workshops are used to explain relevant content and to demonstrate desirable skills. While attending the after-school workshops, the cooperating teachers also work with student teachers in their respective classrooms.

The programs reviewed reflect a high degree of variability in delivery systems; even so, they all approximate a CBTE format to some degree. This suggests that the CBTE model can accommodate a wide range of settings and training orientations and is therefore not necessarily restrictive.

CBTE Criteria

The available data indicate that most CBTE programs rely primarily on authoritative sources for the basis of competency selection. This fact, however, does not impede the generation of comprehensive clusters of competencies, nor does it restrict the utility of such clusters. Once competencies are generated for training programs, most programs are willing to subject competency statements to public scrutiny.

The breakdown in any training program related to CBTE criteria typically occurs when program developers or directors attempt to specify mastery levels for knowledge and/or performance objectives. Those who are successful tend to focus on artifical and/or isolated assessment criteria which lend themselves to easy record keeping paradigms. In addition, although performance criteria are stipulated, they are often arbitrarily determined. The issue of assessment criteria and determination of mastery levels is one which suggests the pressing need to incorporate empirical processes in the design and implementation of CBTE training. An empirical basis for setting mastery levels and prescribing the context in which performance occurs would not be as subject to trial and error.

On the issue of progression through training programs, this review indicates that most programs tend to work under fixed time limits (e.g., intermediate and final termination points, such as the semester system), but a great deal of flexibility is possible within these limits, especially if training is totally under program control (e.g., the last two years of an undergraduate program, with all other course work completed). Some very innovative inservice options which cope well with the schedules of teachers have been developed by the programs reviewed here (University of Idaho: Mark Twain Intership Program, Olathe, Kansas.)

In terms of implied and related CBTE criteria, most programs provide a fair amount of individualization and incorporate some form of feedback. In addition, most programs are systematic, modularized, and employ field-based experiences. These three particular characteristics were probably present to some extent in traditional training programs supplanted by CBTE formats and probably can be identified in numerous programs that continue to project a traditional orientation. Therefore, the most salient related and implied characteristics of CBTE are those which distinguish CBTE from traditional options, i.e., the form and frequency of student/program accountability built into the training system, and the emphasis placed on empirically based program revision. Only a few programs seem highly developed in these areas. The fact that a few diverse training programs reflect such high standards in terms of accountability, protocols, and program revision suggests that such goals are eminently attainable.

Program Evaluation

A great deal of variability is reflected in evaluation paradigms across programs, and this variability holds for descriptions of evaluation programs, designs, and results. Although the context of evaluation in most programs suggests a progression from the symbolic (knowledge) to the natural (real classroom), the progression does not necessarily produce a hierarchy of skill attainment.

Programs which integrate evaluation environments in a logical progression often report gross evaluation data in summarized form. Occasionally, attitude data are offered as the major support for program justification or effectiveness. Only two programs cite pupil change data as evidence of program effectiveness, although three others report using pupil change data as a additional means of determining program effectiveness.

In the design of program evaluations, only three programs employed control groups in determining program effectiveness, and selection of trainees across most programs is nonrandom. A pretest-posttest design appears to be most popular for trainee evaluation; this design and the time-series method are used most often in those evaluation paradigms which include pupil change data.

Criterion tests, opinion surveys, and rating scores are the most frequent forms of instrumentation used, probably because these methods lend themselves readily to descriptive summarization, i.e., percentages. Reliability, when reported, is usually associated with inter-rater stability.

It appears that program evaluation, that is, total evaluation, is often an afterthought in program design and implementation. Although extensive trainee evaluation accompanies a CBTE program, this is often reflected only in summary fashion as attitude change or percentage levels on a series of criterion-referenced tests. Performance evaluation data are often founded on unreliable instrumentation. Pupil change data are infrequently reported. New documentation processes seem most warranted if special education programs are to achieve relevant accountability systems that facilitate effective decision making at all levels of teacher training.

Conclusion

Variety and commonality in structure, substance, and emphasis were reflected in the programs reviewed here. The programs also suggest the problems and strengths inherent in the development of a CBTE format. The final chapters are an attempt to generate a set of guidelines and recommendations for those interested in CBTE program development and revision, and for those concerned with improving research in teaching. If the focus of both interest groups is better trained teachers, then such groups should engage in complementary and interactive efforts that will facilitate the identification of innovative training paradigms and validated teaching skills.

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CHAPTER IV

DISCUSSION AND RECOMMENDATIONS:
Teacher Behavior Research and CBTE

From a CBTE perspective the purpose of research on teacher behavior is to provide an empirical basis for the selection of appropriate competencies and for the assessment of "good" teaching for teacher training. The best criterion for judging the utility of specified observable teacher behaviors is the effect of such behavior on the growth of handicapped pupils. Hence, an empirical base for CBTE in special education would constitute the identification of a set of teacher behaviors which have been demonstrated to have significantly interacted with the characteristics of handicapped pupils to enhance the growth of objectives for such pupils. Our review of the research literature clearly indicates the absence of such a body of empirically determined competencies in special education--or for regular education for that matter. Both pre and inservice teacher training programs throughout the United States are currently in various stages of developing facets of CBTE programs with virtually no objective basis for supporting the competency statements which serve to define their operational objectives. Hence, most existing training programs in special education are predicated on criteria from needs assessments which may be unrelated to pupil growth criteria (i.e., professional biases, philosophical commitments, percpetions of school administrators, etc.).

As we review the body of literature available in special education it is apparent that relatively few researchers have focused their attention on relating specific teaching behaviors to the growth of handicapped pupils. Further, those few attempts to uncover relevant teaching behaviors have been for the most part unsuccessful. Research in teacher behavior has had, as a result, virtually no impact of the field of teacher training in special education generally--nor on CBTE specifically.

Securing An Empirical Base for CBTE Through Teacher Behavior Research

In this section we will attempt to present some critical issues which must be addressed if an empirical basis for CBTE in special education is to be achieved.

The Role of Theory in Teacher Behavior Research. Our review has revealed a paucity of theory directing research efforts in this area. The serious researcher is frequently faced with the necessity of developing a conceptual framework to guide the selection of potentially "high pay-off" variables to study. This process necessitates activity of a theoretical nature which frequently has no obvious relationship to the current "product orientation" of project sponsors. The general unwillingness of sponsors to support activity having a basic or theoretical thrust probably contributes more than any single variable to the general lack of conceptual framework of the research reviewed in the preceding chapters.

The requirements of theoretical work must be drawn from an integration of our knowledge of handicapped learners, the nature of curriculum content, and conception of teaching. To be maximally effective in guiding research in teacher behavior, theoretical conceptualizations must seek to identify those instructional and pupil characteristics which most probably relate to pupil growth. This implies more than the construction of hypotheses related to the effects of one type of administrative arrangement over another. What is needed are efforts to construct models which suggest that teachers with specified characteristics, who demonstrate specified observable teaching behaviors, with pupils having specified learning characteristics will produce desired pupil outcomes within the limits of specific educational contexts. The complexity of searching for functional relationships between presage, process, and product variables in the study of teacher behavior demands a sizable effort in order to prioritize variables for study and potential pay-off. Theory is a powerful tool for organizing such an endeavour. It is, to be sure, not the only promising strategy for uncovering meaningful relationships between teacher behavior and pupil growth. But it is, in our opinion, a necessary component of a total effort. Without the nurturing of sound theoretical conceptualizations we run the risk of floundering in a sea of variables with little hope of maximizing our efforts to develop an empirical basis for CBTE in special education.

> Recommendation 1.00. Agencies supporting research on teacher behavior should allocate funds for the development and preliminary testing of theoretical conceptualizations which attempt to explain and predict, within specified educational contexts, relationships between the characteristics of handicapped learners and the characteristics and behaviors of teachers.
>
> 1.01. Theoretical work should have potential for contributing to the identification of relevant teacher behavior variables which can be directly measured and subsequently filtered to teacher training practitioners in the form of validated competency statements to be included in selection and/or training procedures.
>
> 1.02. Theoretical work should have the potential for developing the basis for a unified cluster of empirical research which is guided by a clearly defined set of constructs within a specified domain or facet of special education.

The Role of Programatic Research. Closely related to the need and importance of theory in studying teacher behavior, is the role and status of programatic research in this area of special education. In almost all instances, our review suggests that efforts in the field of teacher behavior research in special education is characterized by the "one shot" study of relatively short duration. There is an absence of comprehensive long-term commitments to programatic and/or longitudinal research in this area. We believe that the absence of long-term commitments of researchers to problems in teacher behavior research may be primarily due to the federal funding practices rather than to a lack of awareness of need or lack of commitment on the part of researchers. Our perusal of the support structure of research reviewed in the present report reveals that in almost all cases such projects were funded through federal agency sponsorship. Hence, the influence of policies and practices of sponsoring agenices must be considered as a factor in accounting for the relative dearth of programatic and/or longitudinal work in this area.

Programatic research requires relatively heavy financial commitments over protracted time periods and is frequently associated with the need for a considerable degree of freedom on the part of research teams in allocating efforts and resources. This is the case because programatic efforts characteristically require teams of researchers working together and with a differentiated supporting staff; the work is generally of a sequential nature in that projected activities are frequently determined by the results of previous activities of the group. Such requirements are often at odds with the internal policies and practices of federal sponsoring agencies who must consider issues such as relative distribution of limited funds, fiscal policies of government in relationship to cash flow limitations, the requirements of "contract" versus "grant" support, relative risks in putting "too many eggs in one basket" catering to contemporary "short term" needs, etc. Furthermore, large scale programatic efforts require considerable advanced planning and organization--they require extensive basic and theoretical work--all of which freqeuntly conflict with agency policies and practices. The result is that researchers are often unable to adequately address critical conceptual and/or methodological issues, as it is simply easier to conduct "short term" and "one-shot" studies given the current funding patterns of sponsors. The problem, however, is that in seeking to uncover relationships between teacher behaviors and pupil outcomes we are not apt to reach our objectives through one-shot projects of short duration. For example, research directed toward uncovering relevant teacher behaviors which influence the growth of severely handicapped children certainly must account for the uniquely slow growth pattern of these pupils. It is unlikely that sufficient variance in pupil growth could be evidenced over a one or two year period to reveal teacher behavior correlates of such growth. We contend that the nature of the handicapped pupil populations whose growth we seek to maximize through teacher behaviors demands research of a programatic long-term nature. Unless sponsors are willing to support such endeavours both professionally and financially we can expect accommodations which result in single shot studies yielding null results, the selection of independent and dependent variables for study which have limited utility for school purposes, and the structuring of experimental conditions that have limited generalizability to the naturalistic environments in which handicapped children are taught. It appears ironic that those committed to fostering growth among handicapped pupils have adopted policies and practices in the support of research which ignore the unique characteristic of these children.

> Recommendation 2.00. High priority should be given to the support of programatic and longitudinal research on the effects of teacher behavior on the growth of handicapped pupils.
>
> 2.01. Sponsor policies and practices should be reviewed and revised to encourage researchers in the field to undertake the commitments implicit in programatic and longitudinal efforts.

> 2.02. Programatic research programs should be preceded by evidence of completion of the necessary theoretical and methodological work to optimize the potential pay off from the projected systematic research program.

Proposed research of a programatic nature cannot be assessed using the same criteria as those used for single project research proposals. The sponsor must establish a differential set of criteria for each type of research and development activity. To assess proposals of programatic nature using the same criteria as is used for single studies, placing each type of activity in competition for the same funds, is analagous to judging the merits of a particular "gourmet dish" with a carefully planned "gourmet dinner." The "dish" must not be rejected because it does not satisfy our appetites: nor must the "dinner" be rejected because it is more extensive and expensive than the "dish". The point is that the single project and the comprehensive program of research are designed to meet different objectives, each requires different physical and human resources, each requires a different assessment and commitment.

> 2.03. Sponsors should establish different criteria for assessing the support potential of programatic research and individual studies, respectively. Programatic research proposals should never be placed in competition with individual project proposals.

> 2.04. Sponsors should determine the proportion of resources to be allocated to programatic and individual research projects, respectively. Operational criteria should be established for defining proposed research into one or the other category. Assessment of proposals should involve only within-category competition for support funds.

We have indicated the rather fragmentary state of the research literature related to teacher behavior and suggested that one very promising approach to ameliorating this condition is through the support of programatic research efforts. However, our emphasis on programatic efforts should not be construed as an exclusive preference. On the contrary, we found a number of excellent "one shot" studies which if coordinated with a broader network of similar work could contribute significantly to our knowledge of teacher behavior effects. There continues to be a great need for well conceived individual efforts targeted at problems of a more modest nature when compared to programatic or longitudinal research programs. But whether they be field-initiated or request-for-proposals (RFPs), it is imperative that such individual projects address high priority needs in a field having relatively few available research dollars. The pay-off of individual projects can be enhanced through programatic planning at the national level. That is, there is a need for finding a mechanism for coordinating the individual "gourmet dishes" into a "gourmet dinner" prepared by different "chefs" at different "restaurants"-- while not constraining the creativity and particular abilities of individuals from making their most effective contributions.

> 2.05. Sponsors should continue to support individual research projects which conform to national needs in the teacher behavior research area. However, a method should be devised for developing the means for coordinating individual projects through the stipulation of those priorities stated in sufficient detail to permit assessing the importance of proposed work against priorities.

Methodological Issues and Needs in the Study of Teacher Behavior

In the absence of a comprehensive body of literature in special education related to the study of teacher behavior and in the view of the limited resources for support of such activity, the question of greatest pertinence is: which specific activities have highest potential pay-off toward developing an empirical basis for CBTE? We have already suggested the support of theoretical and conceptual efforts as a tool for facilitating such decisions. In this section we turn to a second set of activities which we believe should be considered as relatively high priority if the goal of research in teacher behavior vis-a-vis CBTE is to be realized. These are a cluster of issues and needs which are primarily methodological in nature. They are aimed at the form rather than the substance of research activities but are no less important since they determine the usefulness, reliability, and validity of the results obtained through research endeavours.

Criterion Variable Construction. Our review has left us with the rather uneasy impression that researchers and teacher trainers alike are not clear in their convictions relative to what outcomes or growth variables are most highly valued in considering the progress of handicapped children in the schools. Furthermore, there is little evidence to assist in determining the values held by other relevant groups (e.g., parents, administrators, legislators, etc.) which would help in clarifying the goals of educational programs for handicapped children. If we are to seek those teacher behaviors which significantly influence a handicapped child's growth, it is imperative that we have a thorough understanding of what it is that we are attempting to optimize and/or minimize among handicapped pupils. It would be very useful if researchers did in fact have evidence concerning the extent to which relevant target populations value different outcomes for handicapped pupils of different types, ages, etc. To our knowledge there are no such comprehensive studies reported in the research literature.

> Recommendation 3.00. High priority should be afforded to the study of the values held by various target groups (e.g., teachers, parents, administrators, legislators, community organizations) concerning growth and outcome objectives (e.g., academic growth, social growth, communications growth, moral development, growth in self concept, etc.) for various handicapped pupil populations.
>
> 3.01. Attempts should be made to determine for all target groups sampled, what types of evidence

> would constitute acceptable criteria for assessing growth in the various areas concerned. Attempts should be made to determine which criteria would represent minimal evidence of growth.

While the recommendations in 3.00 and 3.01 are directed toward uncovering the outcomes most highly valued by relevant target groups and the determination of what constitutes minimal evidence for the achievement of growth criteria, it appears safe to assume that academic competence is generally accepted as a high priority objective for most handicapped school aged children. However, there appears to be considerable difference of opinion as to how to measure growth in academic achievement. Many special educators are critical of standardized achievement tests and argue for criterion referenced measures of pupil growth. Others argue that the nature of some handicapped children warrants a more functional approach to academic achievement in contrast to the developmental character of most academic curricula. Hence, it is argued, special education programs frequently emphasize the utility of learning (or teaching) selected facets of academic curricula in preference to a strict adherence to prescribed developmental sequences for particular grade levels. The selected content emphasized in such programs is often not represented through standardized measures of academic growth.

> 3.02. Priority should be given to projects which attempt to develop achievement measures which are commensurate with both the characteristics of specified handicapped populations and defined curricula.

Many special educators contend that fostering the social and/or emotional growth of handicapped pupils is more important than academic growth objectives. The relatively high value afforded to such non-academic growth objectives has not, however, been accompanied by the development of valid and reliable assessment tools applicable for use with exceptional children. There is clearly a need for the development of new methods and tools sufficiently sensitive to uncover change in personal/social attributes of handicapped pupils as a function of teaching.

> 3.03. Priority should be afforded to projects which attempt to develop methods and tools for the valid and reliable measurement of relatively small increments of change among handicapped pupils in the non academic areas of growth. Particular emphasis should be given to measurement of pupil growth in self concept, social competency, communications skills, perceptual-motor skills, attitude development, moral development, cognitive development, other dimensions of personality change, and other personal dimensions relevant to the specified objectives of special education programs.

The extensive use of summative instruments in measurement of the growth of the handicapped, leads us to believe that output variables have been too narrowly defined by researchers. It may be useful to adopt the position that child growth occurs cumulatively in small steps. With children having relatively slow or impeded development it is necessary to adopt a fine grained assessment procedure in determining growth as a function of teaching. Workers who use behavior modification paradigms tend to utilize such assessment procedures in attempting to track efforts to accelerate or decelerate behavior representing a specified objective. However, the classical approach of behavior modification has led to rather limited conceptions of applicable metrics. There is a need for the development of observation teachniques which capture the behavior of handicapped pupils in both controlled and naturalistic environments without necessarily relying on rather simplistic indexes of two stage S-R relationships. There is a need for dependent variables which describe more than the rate and frequency of child behavior in rather contracted behavioral units. Measures which describe relatively complex chains of behavior, which include indexes of intensity and generality are needed.

> 3.04. Priority should be given to the development of valid and reliable observation instruments designed to measure growth of handicapped pupils cumulatively as they function in their respective special educational contexts. Instruments should yield data permitting inferences pertinent to the complex nature of the growth variables under assessment. They should attempt to measure the intensity, duration, and generalizability of behaviors in addition to simple rate and frequency measures. They should characterize logical segments of behavioral samples in addition to simple S-R segments.

Another important concern relates to the source of evidence for child growth. It appears to us that most workers in the field limit their criteria to so called objective test results (e.g., pupil change data drawn from objective instruments). There is a clear need to expand our current conceptions of valid evidence for teaching effects or measuring teacher behavior and its effects. Work which seeks to explore new procedures and sources for generating such data should receive support in spite of the apparent "high risk" nature of such activity. Specifically, we see merit in exploring the development of valid and reliable procedures for determining pupil growth and teacher assessments through direct interviews and/or testing of handicapped pupils and their parents. There is value in determining growth of handicapped pupils from data derived from the perceptions of their peers, teachers, and other relevant populations who interact with such children. Disparities obtained between different sources of data relevant to the same growth variables or teacher behavior variables need not assume standard psychometric interpretations (e.g., lack of concurrent validation with a norm-referenced or criterion referenced instrument). Rather, the study of discrepant perceptions of criterion variable states may assist in a more dynamic understanding of the variables themselves.

Prioritizing Research Designs in the Study of Teaching

Presage Variable Studies. Our review revealed that a relatively high percentage of the existing literature falls into paradigms which seek to relate one set of presage measures to another. Hence, teacher background variables, previous experiences, personal characteristics, attitudes, personality traits, motivations for teaching the handicapped, etc. are typically interrelated. In our view such studies merit relatively low priority for further support. They tend to describe existing characteristics of teachers and/or pupils but add little to building a basis for CBTE programs. Even where such interesting presage variables as reasons for teaching the handicapped, nature of teacher training program received, and personality attributes of the teacher are related to type of children taught, attitudes toward teaching, expectancies, etc. it is our view that relatively little gain is to be achieved by the results of such studies vis-a-vis the establishment of an empirical basis for CBTE in special education.

Presage-Process Studies. Studies which seek to relate pupil and/or teacher characteristics to the teacher-pupil interactions in educational contexts appear worthy of continued support. While relatively little can be gleaned from such studies pertinent to the establishment of competency goals for teachers, they may be useful in stipulating criteria for the selection of personnel to work with the handicapped--particularly if the processes observed have discernible valences relative to what is deemed facilitative in the behavior of teachers in the education of handicapped children. If teacher-pupil interactions are implicitly scaled by decision makers with respect to the objectives of special education for the handicapped, then the relationship of these variables to teacher and/or pupil presage variables may well have implications for policy and practice.

Presage-Product Studies. Studies in this category tend to explore the relationship between pupil or teacher characteristics and the growth of pupil or teacher. In our opinion such studies are generally poor risks relative to producing results having direct policy or practice implications. Hence, we suggest they receive relatively low priority for future support. It is, however, important to point out that such studies may yield interesting results which prove heuristic for more comprehensive subsequent investigations. For example, studies which attempt to demonstrate that certain teacher characteristics (e.g., attitudes, knowledge, previous experience, previous training, etc.) are related to specific pupil outcomes (e.g., reading achievement, change in social acceptance, improved self-concept, growth in motor-perceptual skills, etc.) may lead to hypotheses related to the effects of instructional variables on pupil outcomes--where the teacher presage variables are, in effect, proxies for unmeasured teacher behaviors (e.g., teacher attitudes may be correlated with unmeasured teacher-pupil interaction variables, both of which are correlated with pupil outcomes). If the relationship between the presage and unmeasured process variables is relatively strong, then it may be most parsimonious to focus on the presage variables as potential teacher selection criteria rather than the process (interaction) variables as potential training objectives--since process data are more expensive and difficult to obtain. The problem however, is that previous research both in regular and special education has been particularly unsuccessful in identifying teacher presage variables which predict pupil outcomes. The bulk of educational research literature does suggest that pupil presage variables are excellent predictors of pupil outcomes (e.g., pupil sex, age, intelligence, socio-economic status, entry achievement level, are usually stronger predictors of pupil academic achievement than teaching variables). We believe that the lack of success in identifying relevant teacher presage variables predictive of pupil growth is due to their distal relationship to pupil outcomes in the causal chain of variables explaining such outcomes. In other words it does not appear reasonable to expect to find reliable and meaningful, teacher presage variables which predict pupil outcomes because so many educational process and presage variables interact with these teacher presage variables to mediate, moderate, attenuate and/or suppress their effects. Hence, we argue for highest priority consideration for those studies seeking to relate the most proximal teaching variables to pupil growth in special education.

Presage-product studies ignore the process variables which are proximal to the outcomes of interest--they too frequently assume the pedological processes between teachers and handicapped pupils from the definition of presage variables. These assumptions are often erroneous, thus yielding null results. Hence, the typical presage-product study defines how or by what method a teacher has been trained and seeks to relate these variables to pupil outcomes. The transfer of skills attained in training to classroom operations is typically not studied directly--but rather assumed to have taken place. Hence, many presage-product studies of this type appear to the casual observer to be process-product studies. A teacher having a high verbal intelligence score does not necessarily differ in her verbal classroom behavior from another teacher having a relatively low measured verbal intelligence score. Modulation of verbal classroom behavior of teachers of handicapped children is probably more proximal to pupil comprehension than is the teachers general verbal competence.

Process Studies. Studies which seek to relate teacher and pupil behavior in educational contexts have high priority for support in our view. Such studies promise to uncover teacher behaviors which covary with desirable and undesirable pupil behaviors within special educational contexts. Hence, they promise to yield needed information upon which to build an understanding of teaching effects on instruction of handicapped children and to contribute to the stipulation of specific behavioral competencies needed by teachers of the handicapped. Here again it is important to emphasize that the relationships obtained through such studies are limited to occurrence within particular educational contexts and are frequently descriptive (e.g., teacher questioning level related to pupil response level; pupil off-task behavior related to teacher management style; teacher grouping procedures related to pupil participation in lesson).

Process studies may be conducted under controlled or naturalistic environmental conditions. Process oriented projects conducted in controlled environments usually can control sources of variability through experimental manipulation and randomization and therefore, are expected to increase the internal validity of results reported. Such studies should receive high priority only if they promise to achieve a reasonable level of internal validation through their proposed designs and if the relationships studied have potential for external validation in naturalistic settings.

Field studies of teaching processes have the decided advantage of describing relationships which exist in naturalistic educational contexts within the schools. Such relationships are frequently of relatively high importance and utility because they emerge from a multitude of uncontrolled variables present in the naturalistic educational environments in which they are studied. Such studies are usually fraught with sources of invalidity due to the researcher's inability to control variables. However, relationships obtained under such conditions are apt to be of considerable interest and importance to practitioners in the field as well as teacher behavior researchers. Results of such studies are, however, frequently difficult to interpret--we know that relationships reliably exist but are frequently at a loss to indicate why they exist. The problem with naturalistic process studies is not when significant relationships between pupil and teacher behavior are evidenced, but rather when relationships are disguised or depressed in magnitude due to the many sources of invalidity introduced by poor research design. Hence, we recommend that priority be given to naturalistic process studies only if the proposed designs of such studies permit uncovering the relationships sought.

Another important consideration in prioritizing process oriented naturalistic studies is the issue of cost effectiveness. Such studies are relatively costly, requiring considerable time, energy, and financial resources during the data collection and analysis phases. Therefore, it is essential that naturalistic process investigations be closely scrutinized for adequacy of design and feasibility of all operations proposed prior to receiving support.

Process-Product Studies. Teacher behavior studies which seek to identify those teacher behaviors which are related to pupil growth criteria deserve very high priority consideration for further support. Such studies have direct relevance to both policy and practice in CBTE. Relatively few such studies have been identified and reviewed in the present work. There is a clear need for investigations of this type in all areas of special education. However, it appears unlikely that researchers contemplating such studies would ignore relevant presage variables. We, therefore, move directly to a discussion of the merits of presage-process-product studies.

Presage-Process-Product Studies. It is obvious that the most potentially useful investigations toward developing an empirical basis for CBTE are those that include the three major blocks of variables of the PPP taxonomy. Such studies require comprehensive multi-variate designs and demand both programatic and longitudinal commitments of researchers. They tend to be costly and difficult to conduct. But in our opinion they are deserving of the highest possible priority for support.

It is probably not feasible to expect that pure experimental paradigms can be developed for PPP studies given the constraints imposed by the exigencies of educational research. However, new and exciting methodological innovations are being introduced into educational research which permit the systematic study of complex educational phenomena through the use of multivariate correlational techniques. For example, the emergence of path analysis which has proven so useful in econometrics and sociology is currently being utilized in PPP paradigms in regular education (Berliner & Ward, 1974; Keeves, 1972). The technique permits the construction of mini-causal models which can be empirically tested with path coefficients permitting causal inferences to be made from correlational data. The developments in multiple regression analysis, commonality analysis, and other multi-variate procedures are promising when related to PPP studies in special education (c.f., Kaufman, Semmel, & Agard, 1973). In assessing the particular merit of a proposed project which seeks to study the relationships between presage-process-product variable clusters, it is imperative that investigators incorporate appropriate multivariate procedures to assure that sufficient methodological sophistication and statistical power is attained to analyze the complex relationships being sought.

> 3.05. Priorities for support of teacher behavior studies in special education should be partially based upon the classess of variables which investigators propose to investigate. Priority should be afforded to studies in each category in accordance with the following recommendations.

Class of Variables	Rank	Priority
Presage-Process-Product	1	Highest
Process-Product	2	
Process	3	↓
Presage-Process	4	
Presage- Product	5	
Presage	6	Lowest

Strategies for Studying the Effects of Teacher Behavior on Pupil Growth

We have recommended that designs including all blocks subsumed by the PPP model are most likely to yield highest "pay-off" for establishing an empirical basis for CBTE in special education. There remains consideration of the research strategies through which these variables may be most effectively studied.

Descriptive Correlational Approaches. A number of researchers have attempted to study the relationship between teaching and pupil growth through correlational procedures. Typically, the three classes of variables (PPP) are intercorrelated to determine the strength of relationships between independent and dependent measures. It should be noted that this strategy has yielded minimal validation data for teacher behaviors (competencies) with respect to academic achievement among normal pupils in regular educational programs. With respect to research in the field of special education it appears premature to evaluate correlational methods used for establishing relationships between teacher behavior and pupil growth, simply because so few studies of this nature have been reported in the literature. In the absence of a body of literature from which to infer the most fruitful independent variables to study and with the dearth of theory in this field, most correlational procedures will result in "shot gun" approaches to uncovering relevant relationships.

One potentially promising correlational design was reported by Semmel, Sitko, & Krieder, (1973) in which two year gain scores of TMR pupils on communication skills were used to identify high and low gain teachers (class means) at the extremes of the class gain score continuum. These teachers were then systematically observed using Flanders Interaction Analysis system in an effort to uncover behaviors which discriminate the two groups. Presage variables (e.g., teachers age, experience, etc.) were then related to the performance variables. McDonald (1974), and Berliner and Ward (1974) have subsequently recommended a more powerful strategy having the advantages of greater methodological precision and promise for developing possible causal inferences between blocks of variables. Essentially, these researchers propose a strategy wherein class mean or pupil post-test scores are regressed on the pre-test scores for a large sample of teachers. The researcher then identifies teachers who deviate markedly from the regression function (above and below the line). Then the paradigm calls for intensive study of the teaching behavior and other characteristics of these "outliers." Once identifying the teaching performances that differentiate these teachers from others in the study a hypothesis relating to teacher behavior and pupil growth is established. The hypothesis is subsequently tested through replication and/or experiment.

Using paradigms similar to the one described above it should be possible to isolate specific teaching variables having particularly strong relationships with the growth of handicapped children in school related objectives. Armed with such empirical data, the field can move toward explicating and elaborating theoretical views having considerable empirical support--progressing both conceptually and empirically toward theoretical-experimental research designs which seek to validate causal inferences relative to the effects of teacher behavior on pupil growth. At the end of this rather lengthy chain would emerge empirically validated teacher competency statements with relatively clear indicators as to the conditions under which they can most effectively be acquired by teacher trainees as a function of training. Further, the empirical basis for CBTE in special education would include sufficient information about the relevant attribute by treatment interactions (ATIs) between type of handicapped child and nature of teacher behaviors to lead to meaningful differentiation of training programs--this in contradistinction to contemporary criteria for differentiating between existing programs (e.g., programs of training to teach the mentally retarded, behaviorally disordered, learning disabled, visually impaired, etc.).

Experimental Study of Teaching Effects. One of the most salient features of experimental studies is the requirement of randomization and manipulation of variables. It should be noted that the research reviewed rarely utilized these powerful techniques toward achieving valid results. We contend that in most instances researchers would have preferred utilizing such experimental methods but due to the conditions predefined by the context in which they chose to work such methodological standards are simply not possible. Experimental studies are not easily conducted within the confines of ongoing special education programs in the public schools or training institutions since the priorities of the programs are frequently antagonistic to the demands of experimental rigor. The result is invariably a compromise in favor of the program requirements, with the subsequent result of weakening the research to a point where research findings are frequently questionable against conventional criteria of external and internal validity. Hence, it would appear that there is sufficient reason to propose greater support for experimental studies of teacher effects within contexts under the control of the researcher (i.e., in laboratory settings). Studies performed in the laboratory have the clear advantage of potential control of variables that threaten the internal validity of research results. However, they frequently control the environment in ways which seriously limit the external validity of the results--thus are rarely applicable to the conditions prevailing in the schools. This is why it is our contention that controlled experimentation should procede from a base of both theory and empirical findings drawn from in situ descriptive correlational studies conducted in the schools. Once validating hypothesized relationships through replication in the schools, it would appear appropriate to bring them to the laboratory where systematic manipulation and randomization of the independent variables (teacher behaviors) can be realized. In this way the functional relationship between the teacher's behavior and the pupil's growth can be pursued toward uncovering valid "causal" inferences. In other words, if the phenomena studied under laboratory conditions were originally derived from studies conducted in the schools then the results of laboratory findings would be more apt to generalize to the conditions prevailing in the schools and, therefore, would be more likely to contribute to an empirical basis for CBTE. Our position is succinctly summarized by McDonald (1974), who contends,

> A research and development strategy on teaching competence ought to include both inductive-correlational study and theoretical-experimental studies. Further, each inductive-correlational study ought to be followed by experiments which test the validity of the hypotheses derived inductively. (p. 16)

Generic vs. Specific Competencies. Our discussion has primarily focused on methodological issues closely related to building an empirical basis for the determination of competencies that should be most appropriately adopted as objectives by teacher educators in special education. However, it should be re-emphasized that the convictions and theoretical orientations of researchers will determine in the final analysis, the form and nature of the competency statements. Research in regular education has, for the most part, conceptualized competencies in generic terms which assume that there exists a set of teacher behaviors which will influence the growth of pupils irrespective of the content to be learned and/or the context in which teaching occurs. Hence, we find reviewers of the research literature (c.f. Rosenshine, 1971) reporting such promising variables as: clarity of teacher presentation, teacher enthusiasm, teacher emphasis on learning and achievement, avoidance of criticism, positive response to students, use of structuring comments, and use of differential levels of cognitive demands (questions). When compared to the effort expended, the results of research seeking to discover generic teaching behaviors which predict student outcomes is disappointing to say the least (Heath & Nielson, 1974).

We believe that the current conceptualization of competencies as a set of discrete generic behaviors may be counterproductive in the search for validated teaching behaviors. It should be remembered that generic teaching behaviors are most frequently assessed using frequency of occurrence over a lesson or observation period. The frequency or rate of such behaviors often fluctuates from lesson to lesson or situation to situation for the same teacher. In other words, the within-teacher variance is frequently so great as to call into question the advisability of summing across observations to obtain an index of frequency or rate for a given teacher in a research investigation.

It is clearly not sufficient to know what behaviors teachers have within their repertories but rather we must learn about the conditions under which they choose to emit the behaviors of interest. Shavelson (1976), Morrissey & Semmel (1975) and others have emphasized the importance of this teacher decision making process as perhaps the most important of the "generic teaching competencies." To study the variance between and within teachers relative to teaching behavior therefore, requires greater attention to the contextual variables which undoubtedly contribute to the lack of stability of the so called generic skills. It is, in our opinion, likely that teachers vary their behavior in accordance with the content taught, their perceptions of the state of the learner, the time of the day and day of the week, etc. We therefore recommend that studies seeking to relate teaching behavior to pupil outcomes clearly delimit the conditions of the study such that the contributions of contextual variables can be clearly analyzed or controlled.

What we are proposing is that rather than continuing to seek generic teaching skills, workers in special education would be well advised to search for relationships within specified contextual limits. With specific reference to special education, we suggest that teacher behavior studies focus on specific subject matter fields (e.g., oral or silent reading, mathematics, social studies, etc.) with specified handicapped pupil populations (e.g., visually impaired, orthopedic handicaps, educable mentally retarded, deaf, etc.) within specified administrative arrangements (e.g., in-tact special class, integrated regular class, resource room, etc.) and with specified teacher populations (regular elementary, special class, resource, etc.).

> Recommendation 4.00. Studies attempting to relate teacher behaviors to pupil outcomes should focus on behaviors within specified contexts and with specified student populations.
>
> 4.01. Relatively low priority should be afforded to those research designs which seek to uncover generic teaching skills while ignoring relevant contextual and subject variables which have high probability of qualifying obtained results.
>
> 4.02. Relatively high priority should be afforded to studies which seek to specifically study how the same teaching behaviors differ in frequency

and/or rate as a function of different content taught, different pupils taught, under different administrative arrangements, and/or under differing environmental conditions.

Recommendation 5.00. Studies which attempt to specifically investigate the variables associated with teacher decision making relative to the use of identifiable teaching behaviors should be encouraged and supported.

5.01. Of particular importance are those studies which seek to validate models of teacher decision making strategies. Studies in this category which seek to explicate why teachers of the handicapped utilize one teaching behavior in preference to another in his/her repertory at a given point in time with a student or class at a specified learning level are very important to our need for uncovering the most effective strategies for teaching handicapped children and translating these strategies into trainable teaching competencies. Hence, we recommend particular support for programatic efforts in this area.

NIE Conference on Studies in Teaching

The National Institute of Education sponsored a national conference on studies in teaching during the summer of 1974 for the purpose of providing "an agenda for further research and development to guide the Institute in its planning and funding over the next several years." One hundred "respected practitioners, administrators, and researchers" were convened into ten panels through which intensive analysis of extant knowledge and recommendations for needed further inquiry emerged for respective panel topics. Each panel's report has been published (Gage, 1975) and represents an invaluable source for those interested in promising research and development directions for the future.

The NIE conference reports have particular relevance to workers in the field of teacher behavior research in special education interested in issues of CBTE. Many of the recommendations of the NIE panels are applicable to issues in training teachers to work with handicapped pupils. Space does not permit comprehensive review and discussion of all the panel reports. However, we have selectively drawn from one report which appears to be most relevant to the topics of the present review.

Teaching as Clinical Information Processing (Panel 6). Panel 6 (Gage, 1975) discussed teaching within the conceptual framework of clinical information processing. Seven approaches are recommended:

6.1 Examine the Clinical Act of Teaching

6.2 Examine the Perceptions, Attributions, and Expectations of Teachers

6.3 Develop the Means to Improve Cognitive Processes in Selecting among Instructional and Organizational Alternatives

6.4 Examine the Effects of Reflection and Feedback on Teacher Perceptions, Attributions, and Expectations of Self, Role, and Teaching

6.5 Examine Organizational and Structural Determinants of Cognitive Functioning in Teaching

6.6 Develop Methods for Research on Teaching as Clinical Information Processing

6.7 Develop Theory Concerning Teaching as Clinical Information Processing

The major thrust of the panel's deliberations is succinctly stated by the panel chairperson, L. Shulman:

> The cognitive processes with which Panel 6 was concerned include perception, expectancies, diagnostic judgment, prescription, and decision making. An understanding of these processes can be applied in further research on teacher selection, teacher education, and the development of technological or staffing innovations congruent with ways teachers think and feel. (Gage, 1975, p. 1).

Much of the education of handicapped pupils involves the diagnosis of the status of the learner. Hence, the recommendations of the panel which focus on examining the clinical act of teaching has equal relevance for special educators. We therefore concur with the following recommendations for future inquiry and extend the need to the field of the handicapped:

> Recommendation 6.00. Support should be afforded to efforts which seek to systematically analyze the diagnostic process of teaching as applied to specified handicapped populations for specified content areas under specified administrative-organizational systems.

> Recommendation 6.01. Support efforts to systematically examine the "pervasiveness of bias in the diagnostic inferences of teachers" when applied to inferences about specified handicapped pupil populations within the context of specified content areas and under defined administrative arrangements.

The above recommendation includes the analysis of teacher diagnosis in both the active and preactive phases of teaching.

> Recommendation 7.00. Support efforts to systematically study "the perceptions, attributions, and expectations of teachers" of specified handicapped pupil populations under specified educational contexts.

Studies in this category would include the assessment of the effects of teacher expectencies, stereotyping, and labeling of handicapped children on both teaching behaviors and pupil outcomes.

The NIE Panel 6 points out that in addition to making judgments about pupils, "teachers make general assessments about the organization of classrooms and themselves for learning. Teachers have perceptions and make judgments regarding grouping of students, arrangement of physical settings, instructional materials and methods, topics and objectives." These perceptions have a profound effect on how handicapped pupils will be educated. In other words, not only is it important that we understand the diagnostic process used by teachers in forming perceptions of the learner but we must also understand the perceptions of teachers relative to instructional variables. Hence, the following recommendations have particular applicability for potentially identifying competencies needed for the effective education of handicapped pupils:

> Recommendation 8.00. Support systematic efforts which seek to examine the grouping of handicapped pupils in different types of educational settings as a function of teacher cognitive determinants.

> Recommendation 9.00. Support systematic studies which seek to examine individualization of instruction in relationship to teacher diagnostic processes and teacher expectancies, attributions, etc.

Our review of Jacob Kounin's work suggests that teachers who are aware of what is transpiring in classroom environments tend to be more effective than those who are not "with it". Teachers of handicapped children are frequently unaware of the dynamics of interacting with their pupils--and are often at a loss to explain why they react to their handicapped pupils with specified pedagogical techniques. In some instances they are unaware that they are in fact acting in ways that are objectively observable. Hence, there is a need to study the relationship between teacher awareness, teacher behavior, and handicapped pupil behavior and growth.

> Recommendation 10.00. Support research efforts which attempt to systematically study how teacher self-awareness relates to the processes and products of special educational interventions for specified handicapped pupil populations under defined educational contexts.

In support of the above recommendation Panel 6 states:

> In order to reveal the "blind spots" of teachers, we need more studies of the sort that have already begun to show how inaccurately most teachers estimate the frequency of their interaction with various students in their classroom. These studies will require classroom observers to tally the flow of events and check those tallies against teacher estimates or predictions. (p. 43)

Motivation for teaching handicapped children is a complex issue. However, it is reasonable to contend that such motivational dynamics must have particular importance in determining the effectiveness of teaching handicapped pupils. "As in any occupation, the morale and satisfaction of the teacher are important determinants of his or her performance in the classroom."

> Recommendation 11.00. Support systematic attempts to relate the motivations of teachers of handicapped pupils to the processes of teaching such pupils.

Specific Competencies for Teaching the Handicapped

Special educators have attempted to define the salient variables that differentiate special educational interventions from those that characterize regular education. However, the question, "What's special about special education?" has not, in our opinion, been answered (Semmel, 1975). In relation to building an empirical base for identified competencies needed by teachers and other personnel who work with the handicapped it is important that the field attempt to answer this question, at least within the limited confines of teacher behaviors. Hence, we must focus on the discovery of those competencies unique to teaching specific types of handicapped pupils as well as those which apply across handicapping conditions. The latter cluster of competencies are analagous to what we have previously referred to as generic skills while the former fall into a cluster which we refer to as spcific skills. Following the logic presented in the previous section, we propose concentration first on the identification of specific competencies followed by investigations which seek to generalize the applicability of these variables across different handicapped and non-handicapped learner groups.

In a field where almost no research exists relative to validated teaching procedures for the handicapped, it is difficult to determine the best strategy for the identification of teaching behaviors which are unique to effecting maximum growth among specified groups of handicapped pupils. Where shall we begin? What sources are available or could be developed to guide research in this area? We propose beginning with those variables which define and therefore differentiate handicapped children into groups with respect to the growth variable(s) of interest. Hypotheses relative to effective teaching behaviors will most likely emerge from intensive analysis of the empirical literature pertaining to the status and growth characteristics of specific handicapped populations.

For example, if we were interested in identifying teacher behaviors that facilitate growth in reading comprehension among children identified as "behaviorally disordered" in the public schools, we might well review extant theory and research on the characteristics of such children, as related to both reading behaviors and general learning and personality characteristics. Synthesizing these findings with a particular theoretical orientation to behavioral disorders should result in the positing of a set of interrelated hypotheses about the effects of specific teacher behaviors during reading instruction and their effects on formative and summative measures of reading comprehension among behaviorally disordered pupils. Since we are primarily interested during this phase, in identifying those teacher competencies which are particularly relevant to a specific population of handicapped children, it is not necessary that comparative effects on other pupil populations be tested at this time. However, to achieve a greater economy in our research efforts we see no reason why the testing of hypotheses directed at a specific handicapped pupil population should not be tested with other clearly specified pupil populations simultaneously through research paradigms which permit blocking on the pupil type variable. Such investigations have the advantage of identifying those teacher competencies which uniquely interact with specific pupil populations while at the same time yielding those "generic" skills which appear equally effective across different handicapped and non-handicapped pupil populations. If significant interactions within similar instructional contexts (e.g., content taught, administrative arrangements, etc.) do not emerge, and generic skills are demonstrated to generalize across groups, then significant feedback to training programs can be expected which will have particular relevance for categorical or non-categorical teacher training.

A second major concern specific to special education relates to administrative arrangements within which instructional programs for the handicapped are conducted. These variables are too frequently used as proxies in defining the instructional program itself. We frequently refer to "special class programs," "resource room programs," "residential school programs," "the consulting teacher program," etc. as though they were more than administrative arrangements--often implying differentiated instructional practices, curriculums, and specialized conditions. It is therefore important that investigations seeking to identify effective teacher behaviors either control for or systematically study the effects of these administrative arrangements. It is probable that differential effects on the same dependent variable with the same pupil population using the same teaching behaviors may be demonstrated as a function of different administrative arrangements. We therefore propose that teacher behavior studies include specific consideration of administrative arrangements in their designs.

A third major cluster of variables which deserve specific attention in designing teacher behavior research in special education is lesson content. Curriculum for the handicapped frequently differs along many dimensions when compared to curriculum for regular educational programs. Hence, any study which seeks to identify specific teaching behaviors validated against pupil growth criteria of specified handicapped populations within specified administrative arrangements must control or systematically vary the content taught.

In summary, we propose that three of the most salient features differentiating special from regular education programs are (a) the variables which define respective handicapped groups--handicapped pupil characteristics, (b) the administrative arrangements within which the instructional program is conducted, and (c) the specialized content of the instructional program.

Teacher behavior can most efficiently be studied when considered in relationship to these three contextual variable blocks. For maximal utility toward building and empirical base for CBTE in special education, we must know which teacher behaviors interact with variables clustered within and between these blocks and which generalize to all of the contexts. While most studies cannot be expected to systematically investigate all of these variables simultaneously, research designs should at the very least seek to control those not to be systematically investigated. Optimally, research on teacher behavior in special education should eventually be in a position to report the contributions of each variable block to pupil growth in relevant curriculum areas and the nature of any interactions which exist between these blocks of variables. What we are seeking is the nature of the TB x HP x AA x IC interaction and all other lower level interactions as well as the main effects of each variable cluster; where, TB are teacher behaviors, HP are handicapped pupil populations, AA are different administrative arrangements, and IC are different instructional contents.

> Recommendation 12.00. Teacher behavior research in special education should include designs which permit control and/or systematic study of the main effects and interactions of teacher behaviors (TB) hypothesized to be relevant to specified handicapped populations, specified samples of pupils drawn from identified handicapped pupil populations (HP), different administrative arrangements (AA), and different instructional contents (IC).

Systematic Study of Teacher Behavior in Special Education

Multivariate Analytic Procedures. It is perhaps worthwhile to indicate that we are not necessarily implying that the variable blocks recommended for study be subjected to experimental paradigms with the usual corresponding analysis of variance statistical procedures. Our recommendations hold when applied to descriptive-correlational models utilizing multiple-regression and other multi-variate correlational techniques. When applied to general linear models, we are seeking a function of the general form:

$$G = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_1 X_2 + b_6 X_1 X_3 + b_7 X_1 X_4 + b_8 X_1 X_2 X_3 + b_9 X_1 X_2 X_4 + b_{10} X_1 X_2 X_3 X_4$$

where b_1 through b_{10} are the regression coefficients associated with these vectors, G is the predicted criterion growth variable, X_1 is teacher behavior, X_2 is the handicapped pupil group membership variable, X_3 is the administrative arrangement variable, and X_4 is the instructional contents variable.

It will be noted that the model is expressed in restricted form, omitting interaction terms which do not include the X_1 (teacher behavior variable) but including the contributions of the X_2, X_3, and X_4 variables additively. In effect, the restrictive model indicates the researchers' interest in the contributions of each of the variables taken alone and those variables interacting with X_1 on the prediction of the pupil growth criterion variable, since it is assumed that the major interest in the study is on the effects of X_1 and interactions of other variables with it on the growth variable. If the cross-product terms not containing X_1 (e.g., X_2, X_3, etc.) can affect growth, the contribution of teacher behavior (X_1) to growth will be generally over estimated. We can express the full model with all the possible terms and test whether the difference between the full and restricted model are statistically significant. The possible nonsignificance of the above test gives statistical justification to the researcher's preoccupation with X_1.

Through standard multiple regression analysis we are first attempting to discover the best linear combination of predictor variables which account for the greatest proportion of total variance in the criterion variable (that combination which maximizes R^2--the square of the multiple correlation).

We then seek to uncover which variables in our linear combination contribute most to R^2. Use of standard forward step-wise regression computer programs permit the researcher to enter variables systematically to determine the contribution of each variable (including interaction variables) to the variance of the criterion variables. Since the proportion of variance added is sensitive to the order of inclusion of variables, we may start with the total variance of the criterion variable (R^2) and reduce the variance by eliminating the variables one by one (backward regression). The reduction in variance due to the elimination of any variable is the contribution of that variable. Comparison of forward and backward stepwise regressions permit us to judge the "best" order of variables. Most computer programs permit the researcher to determine the effects of withdrawing individual variables as well as allowing the researcher to determine the effects of adding individual variables (e.g., SPSS multiple regression package).

As Kerlinger and Pedhazur (1973) have so cogently argued, multiple regression techniques have particular applicability to behavioral research and should be utilized far more frequently by researchers studying educational problems than is presently the case. In the present context we submit that multiple regression analysis (MRA) techniques are not only useful in solving many recurrent methodological weaknesses found in the research literature, but they are uniquely cost/effective in such work. In fact analysis of variance and covariance are degenerative cases of multiple regression analysis, and problems approached through ANOVA or ANCOVA, can also be solved in a MRA framework. If the reader agrees that presage-process-product studies are most promising for building a basis for CBTE then we must recognize that such paradigms entail extensive commitment of resources for data collection. The result of such data gathering procedures will be the collection of a massive data base. Without the appropriate application of multivariate analytic techniques, much of the information collected will simply remain on file in an unanalyzed form--resulting in wasted data and inefficient research. This is, we believe, the case in a relatively large proportion of the studies reviewed in the previous chapters of this review.

Multiple Dependent Variables. A second issue related to the need for more omnibus use of multivariate techniques relates to the collection of multiple dependent variables in teacher behavior research. Growth variables are extremely costly to collect since they are frequently composites of replicated measurement across specified time periods (e.g., pre-posttesting). However, the greatest expense appears to be in gaining access to subjects and arranging to take the measures needed. Hence, it appears to us that comprehensive teacher behavior studies can be made more efficient if they are designed to test the effects of independent variables on multiple growth variables (multiple products). Studies which seek relationships between presage and process variables on growth variables simultaneously (such as attitude change, academic achievement, social growth, change in emotional stability) will obviously yield considerably more extensive information than those which focus on only one growth variable. In most instances the additional resources needed to add dependent variables to comprehensive data collection efforts are minuscule in comparison to the increments in information obtained.

Several dependent variables can be studied and analyzed simultaneously through the use of existing multivariate techniques--most of which are readily available in computer program libraries. Canonical correlation, for example, is a generalization of multiple regression analysis which permits the study of many criterion variables collected from descriptive-correlational field studies. Multivariate analysis of variance (MANOVA) has a parallel application to experimental studies using more than one dependent variable. The emergence of these techniques over the past ten years has apparently had little influence on approaches used by special education researchers in their study and analysis of teacher behavior effects on handicapped pupils.

> Recommendation 13.00. We strongly recommend support of any activity which seeks to systematically bring multivariate analysis techniques to the attention of active researchers in the field of special education and which fosters their more regular application to the problems addressed in this review.
>
> 13.01. Studies which seek to investigate the effects of multiple independent variables on multiple dependent variables simultaneously, deserve priority support providing they utilize appropriate multivariate data analysis procedures.

Building Mini-Theories and Testing Causal Influences Using Correlational Techniques: Path Analysis. A particularly appealing technique for inferring causality from the relationships between variables is Path Analysis (Blalock, 1968; 1971). In this method the researcher is drawn into the construction of mini-theories which hypothesize the direct "causitive" and indirect relationships between variables. When the method is applied to problems in the study of teacher behavior in special education it has particular heuristic value. For example, consider the researcher who wishes to study the direct influence of variables such as content taught, administrative arrangements, the group identification of handicapped pupils, teacher behaviors, and pupil behaviors on pupil growth in social adjustment. The researcher constructs a path model showing the possible causitive relationships (paths) between these variables. Figure 2 is an example of a path model that might be constructed.

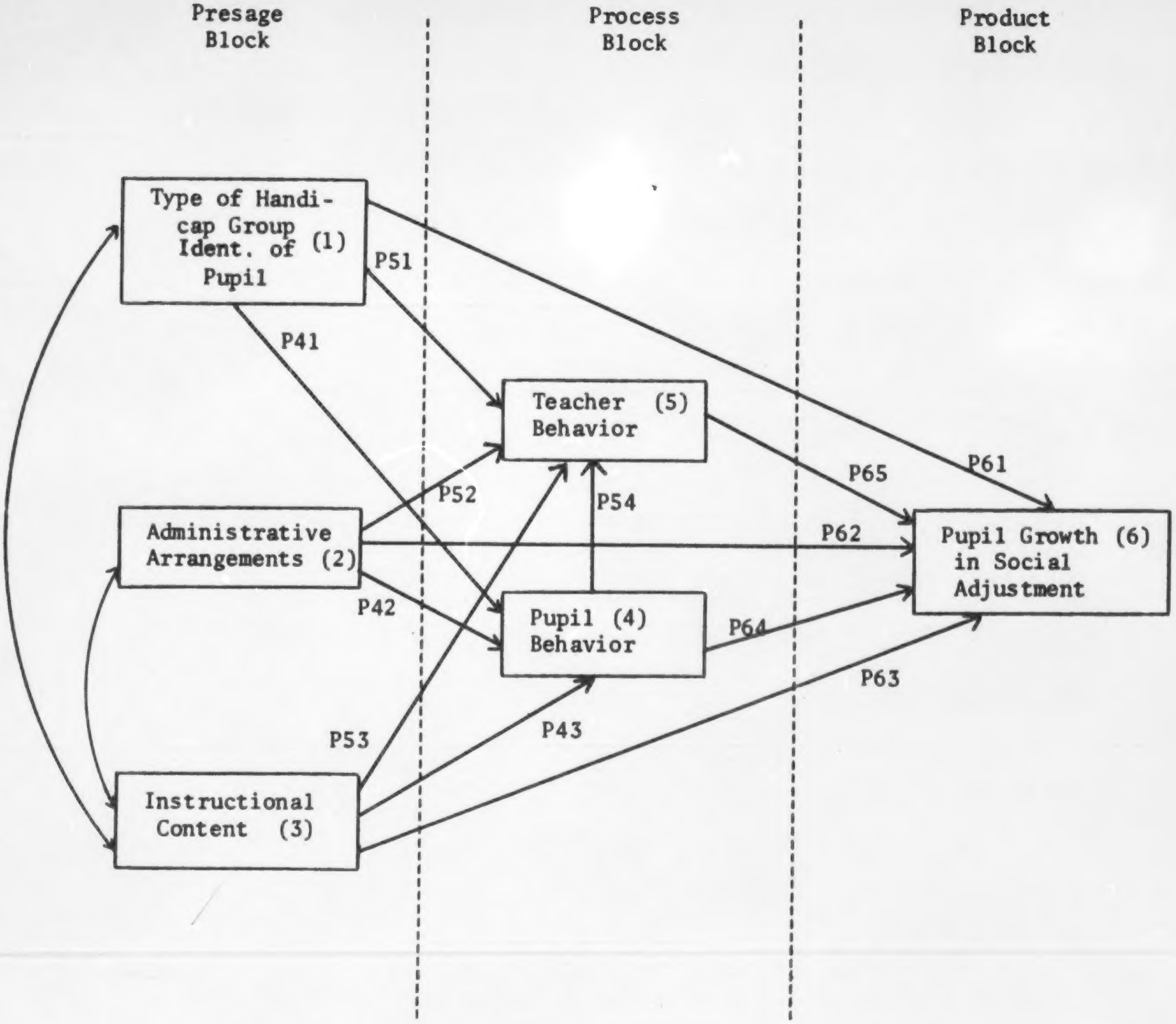

Presage Block
Process Block
Product Block
Type of Handicap Group Ident. of Pupil (1)
Administrative Arrangements (2)
Instructional Content (3)
Pupil (4) Behavior
Teacher (5) Behavior
Pupil Growth (6) in Social Adjustment
P51
P41
P52
P42
P53
P43
P54
P65
P61
P62
P64
P63

Figure 2. Causal path model showing hypothesized direct and indirect influences of variables.

It will be noted from Figure 2 that the model offers a number of potential paths or causal chains to explain pupil growth. The researcher in the present case is not interested in accounting for variables 1, 2, or 3 so they are defined as exogenous to the system as indicated by the curved arrows which represent simple zero-order correlations. However, it is hypothesized that these variables may have direct influence on either teacher behavior (variable 5) or pupil behavior (variable 4). On the other hand, an indirect influence of exogenous variables on teacher behavior through pupil behavior is also hypothesized, and pupil behavior in turn is hypothesized to have direct influence on teacher behavior. Teacher behavior is predicted to have direct influence on pupil growth. The model proposes that one or more of the exogenous variables directly influence teacher behavior which in turn has a direct influence on pupil growth. It also suggests that one or more of the exogenous variables have a direct influence on pupil behavior which in turn has a direct influence on teacher behavior which influences pupil growth directly. We also note that the model suggest a direct influence of one or more of the exogenous variables on pupil growth. Through recursive equations, path coefficients are determined for each of the paths. In the present case, the researcher theorized that pupil behavior has direct influence on teacher behavior. The opposite relationship might just as easily be hypothesized by constructing a second model and testing it using the same path analytic procedures. However only the correct relationship will reproduce the correlation matrix. In this way it is possible to empirically ascertain the most likely causitive model; it is also possible to propose a model, test it, and modify the model in cycles, thus yielding a particular model which is theoretically plausible and compatible with the data.

The model presented in Figure 2 illustrates one technique for combining theory construction concerning the influences of the three exogenous presage variables with both teacher and pupil process behaviors on pupil growth (a product variable). However, content specific causal models may be even more useful to the researcher in special education who is interested in studying teacher behavior using multivariate correlational techniques. Path models can be constructed to study teaching effects within one handicapped population, for one type of administrative arrangement, for a single content area. The effect of holding these exogenous variables constant will limit the generalizability of the results but should lead to more intensive study of teaching behaviors. The holding of one exogenous variable constant and performing separate path analyses, e.g., one for math and one for reading will show the quantitative as well as qualitative differences in achievement in math and reading. For example, Figure 3 is a model that might be constructed to study the effects of various teaching variables within the context of oral reading instruction for EMR children in the intermediate level special classes--with the objective being the identification of relevant teacher oral reading behaviors which influence pupil growth in oral reading achievement. In this example, two exogenous teacher presage variables (the training received by the special class teachers and the age of the teachers) are included in the model. Four teacher prompting behaviors constitute the teacher process behaviors whose direct influence on pupil emission of correct words and/or meaningful substitutions (miscues) are to be studied. Both the influence of the teacher prompting and the pupil process variable (correct words/meaningful miscues) on oral reading achievement (the product or growth variable) are also hypothesized in the model. Our hypothetical path analyst has hypothesized the most probable causal chain based upon theoretical predilections and synthesis of existing evidence related to the teaching of

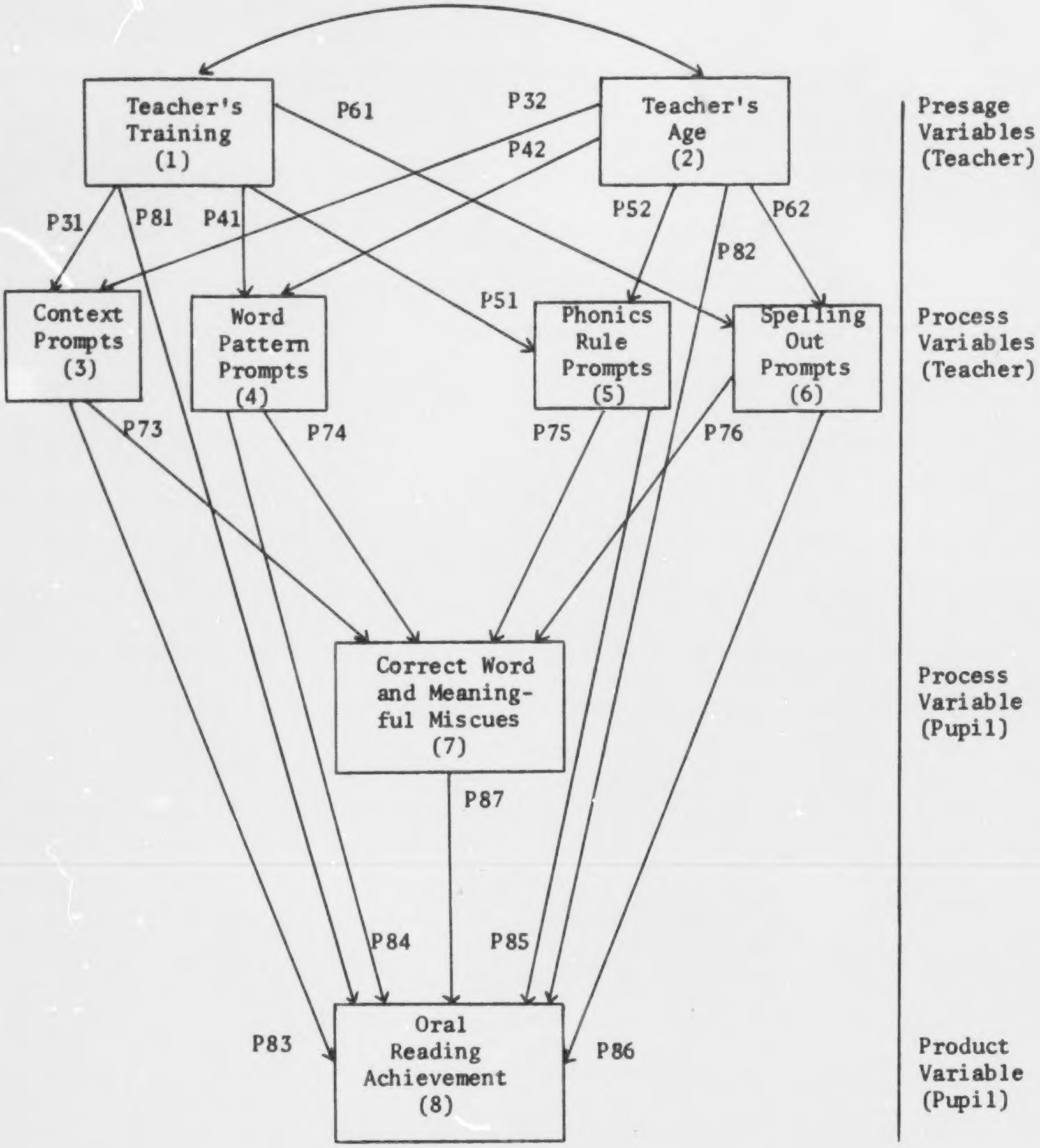

Teacher's Training (1)
Teacher's Age (2)
Presage Variables (Teacher)
P61
P32
P42
P31
P81
P41
P52
P62
P82
P51
Context Prompts (3)
Word Pattern Prompts (4)
Phonics Rule Prompts (5)
Spelling Out Prompts (6)
Process Variables (Teacher)
P73
P74
P75
P76
Correct Word and Meaning-ful Miscues (7)
Process Variable (Pupil)
P87
P84
P85
P83
P86
Oral Reading Achievement (8)
Product Variable (Pupil)

Figure 3. Path model for validating "causal" relationships between teacher presage variables, teacher process behaviors in prompting oral reading miscues of EMR pupils, pupil process behaviors following teacher prompts, and oral reading achievement of pupil product variable.

oral reading to EMR pupils. It might be argued, for example, that teachers trained in a certain manner, independent of their current age tend to utilize context prompts in preference to other prompts in their repertoires. The reasoning is that contextual prompting exerts a powerful influence in determining the number of correct responses or meaningful miscues emitted by the pupil. Finally, it is posited that the number of correct responses and meaningful miscues during oral reading lessons will have a direct influence on the pupil's growth in oral reading as measured by a summative oral reading achievement test. In effect, then, the researcher is positing an explanatory chain of variables to account for oral reading achievement, which is identified in Figure 3 as P_{31}, P_{73}, P_{87}. After subjecting the hypothesized paths along with the competing hypothesized causal flows to empirical correlational analysis, (Figure 3), support for one teacher prompting technique in preference to another may be established. In the present case it is also possible that not only the teacher behavior, but the teacher training procedures that preceded the behavior may be validated. Further, through inclusion of a pupil process variable it is possible to assess the influence of teacher performance on proximal formative pupil behavior and to assess the influence of such pupil classroom behavior on summative measures of oral reading achievement.

While path analysis techniques appear very promising for teacher behavior research a caveat is necessary prior to leaving the subject. The reader must be sensitive to the assumptions underlying path analysis which may be unwarranted given the nature of the phenomena researchers in the teacher behavior area wish to investigate. Path analysis assumes that the variables included in the model are both linear and additive--an assumption frequently violated by variables studied in the teacher behavior area. Hence, it must be remember that curvilinear relationships can be used in path analysis only when we know the exact functional relationship between the independent and criterion variable, as the form of relationship must be theoretically justifiable. It is also noted that the flow of the variables in recursive path models move in only one direction of the causal path; these models cannot be used when reciprocal causation is postulated. Reciprocal path models can be analyzed only when certain mathematical conditions are satisfied. Hence, they are much more difficult to analyze than recursive models. Finally, the researcher should consider the assumption that all variables involve interval scaling. The violation of the latter assumption does not, however, appear to be serious since the application of ordinal measures have been used with minimal negative effects by a number of researchers.

Path analysis is a powerful tool which is potentially very useful to a field which currently suffers from a dearth of theory and a major dependency on non-experimental research findings. Hence, it would appear to have particular relevance when appropriately applied to the study of the presage, process and product variables which are most salient to understanding the dynamic influences of variables on various growth objectives established for handicapped pupils.

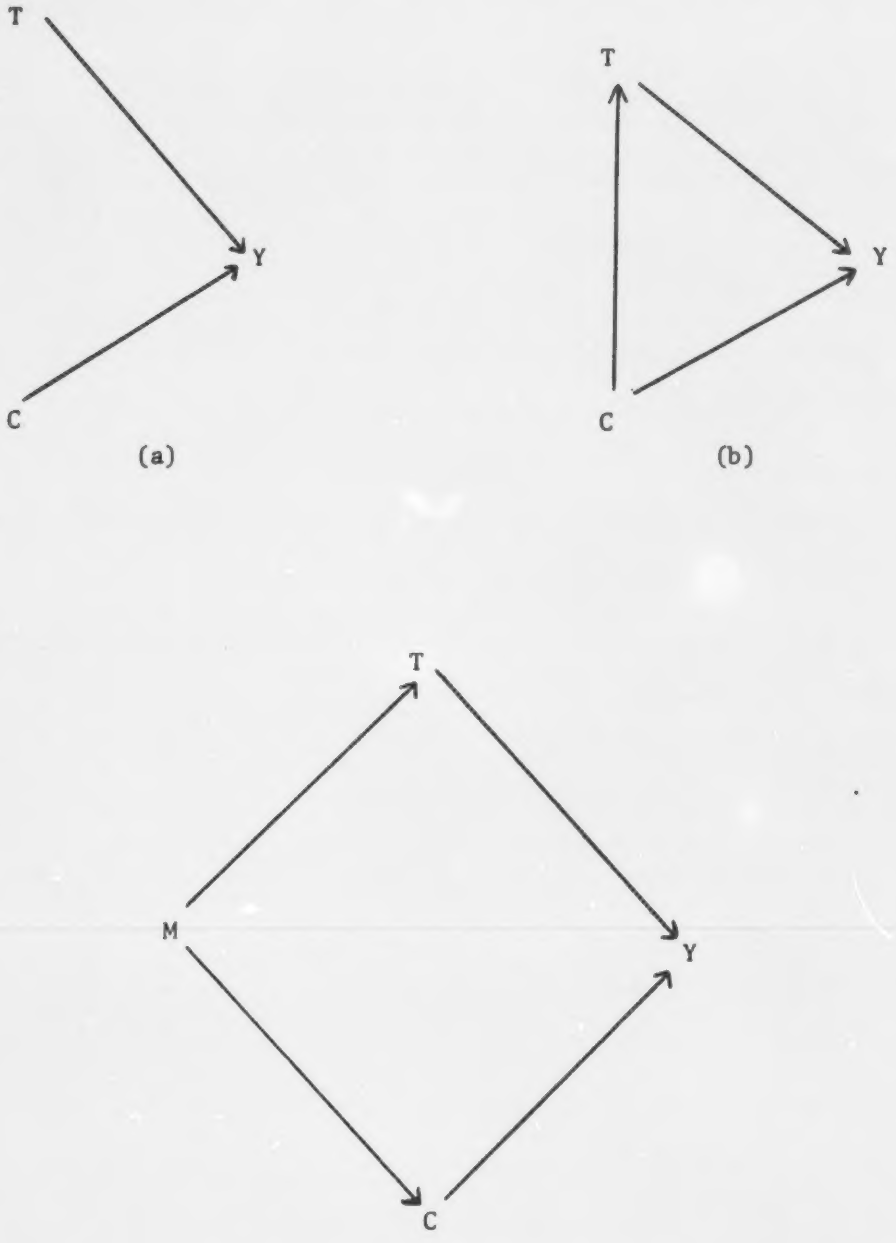
Path analysis may be used in instances where the employment of analysis of covariance (ANCOVA) is untenable. It may be fruitfully employed in all instances, whether the assumptions of non-causal relationship between covariates and treatment variables are met or not. ANCOVA is used extensively in educational research to statistically adjust for the difference betwen subjects on some variables (covariates, e.g. IQ). It enables us to find out the effect of treatment on criterion Y, adjust for differences in specified subject variables, so that the results of treatment effects are not clouded by these status differences among subjects. However, ANCOVA requires a number of strict statistical assumptions, the most important of which is that the treatments (T) do not causally affect the covariates (C) (or vice versa). This assumption is shown in path model, Figure 4 (a).

It may be possible that the covariate can causally affect the treatment, or that both treatments and covariates can be affected by another manipulative factor M. These are shown in Figure 4 (b) and 4 (c).

It must be emphasized that the causal structure of Figure 4 (b) and 4 (c) need _not_ be actively manipulated by the researcher. The method of grouping or dividing the subjects into two groups of high and low achievers on pretest scores, and using pretest scores as covariates of posttest scores--can produce the causal structure in Figure 4 (b). If we select subjects from racially isolated residential districts and find the effect of attitude towards school on achievements using SES as covariate, we may have the causal structure in Figure 4 (c); racial isolation causing both attitude and SES. (Whether this hypothesis is "true" is irrelevant to the discussion; we can subject the causal model to statistical testing.)

> _Recommendation 14.00_. Priority should be afforded to activities which seek to apply path analytic procedures to the study of presage, process, and product variables associated with the determinants of growth among handicapped pupils.

Linear and Curvilinear Relationships. The relationship between teacher performance variables to pupil growth variables is too frequently thought to be a linear function. This assumption of linearity leads researchers to generate hypotheses of the general form; given an increase in rate or frequency or intensity of a particular teacher behavior variable, there will be a corresponding increase in the rate, frequency and/or intensity of a pupil growth variable, regardless of the strength of the relationship. The function is represented by a straight line. Since linearity is frequently



(a) (b)

(c)

Figure 4. Path models showing possible relationships between treatments (T), covariates (C), manipulative factor (M), and criterion (Y).

an assumption underlying of the more popular statistical procedures used in the behavioral sciences, it is perhaps reasonable to suggest that some researchers adopt the assumption based upon the requirements of their statistical tests in preference to considering the assumption in light of their theoretical and/or empirical beliefs. As research findings in regular education accrue it is becoming obvious that quite a number of teacher behavior variables are curvilinearly related to pupil outcomes. For example, the teacher's use of praise and approval reveals a non-linear relationship with pupil achievement. Teacher acceptance of pupils' ideas, teacher use of criticism, and teacher use of "high-order" categories of knowledge have been demonstrated to relate curvilinearly with pupil achievement. Teachers use of "divergent" rather than "covergent" questions has a non-linear relationship to pupil vocabulary growth. Several other such non-linear functions have been reviewed by Dunkin & Biddle (1974), Medley, Soar & Soar (1975).

Curvilinearity is particularly important when applied to the teaching of various handicapped pupil populations. The cognitive, affective, linguistic, and sensory-motor characteristics which define and assign pupils to respective handicapped populations may have higher probability of interacting with environmental variables generated through teaching performance to reveal non-linear functions. For example, the teacher's use of repetition and drill in teaching mentally retarded pupils arithmetic fundamentals may result in a complex relationship between the children's acquisition of arithmetic facts and the teacher's use of drill such that those teachers who use relatively little drill and redundancy produce relatively little gain; while teachers who use a great deal of drill and redundancy produce similar effects. Teachers who use some medial frequency may produce relatively high gains. In this example, it is possible that the characteristics of the learners are such that there is need for repetition of learning trials to acquire arithmetic fundamentals, but the same children tend to lack intrinsic motivation for learning. Hence, extensive use by the teacher of repetition through drill produces a relatively stable stimulus environment to which the pupils rapidly habituate--with a consequent reduction in learning. The relationship described in this hypothetical example is shown in Figure 5. The reader will note that if standard linear analysis models were applied to these data the relationship between the teacher behavior of interest and the pupil growth variable would be obscured. Methods exist for directly testing the assumption of linearity and the nature of the complex relationships that may exist between independent and dependent variables used in teacher behavior research.

The study of curvilinear relationships can also be applied to determine optimal teaching behavior. In the above example, the relationship between frequency of drilling (X) and residualized gain scores (Y) can be given as: $Y = b_1X - b_2X^2$. As X increases, Y increases, but at some point the effect of X^2 takes over and Y decreases. By performing a routine multiple regression analysis of Y with X and X^2 we can obtain the value of b_1 and b_2. This would enable the researcher to determine how far teachers can increase drilling before such behavior reduces the gain, i.e., the optimal amount of drilling.

> Recommendation 15.00. Researchers who propose to study the effects of teacher behaviors on pupil outcomes in special education contexts should be required to routinely test the assumption of linearity. Since many variables of interest in the behavioral sciences are undoubtedly not linearly related, researchers should be encouraged to study non-linear relationships using appropriate methodological procedures and techniques.
>
> 15.01. Researchers should study the non-linear relationships to theoretically and empirically validate the particular form of curvilinear relationships.

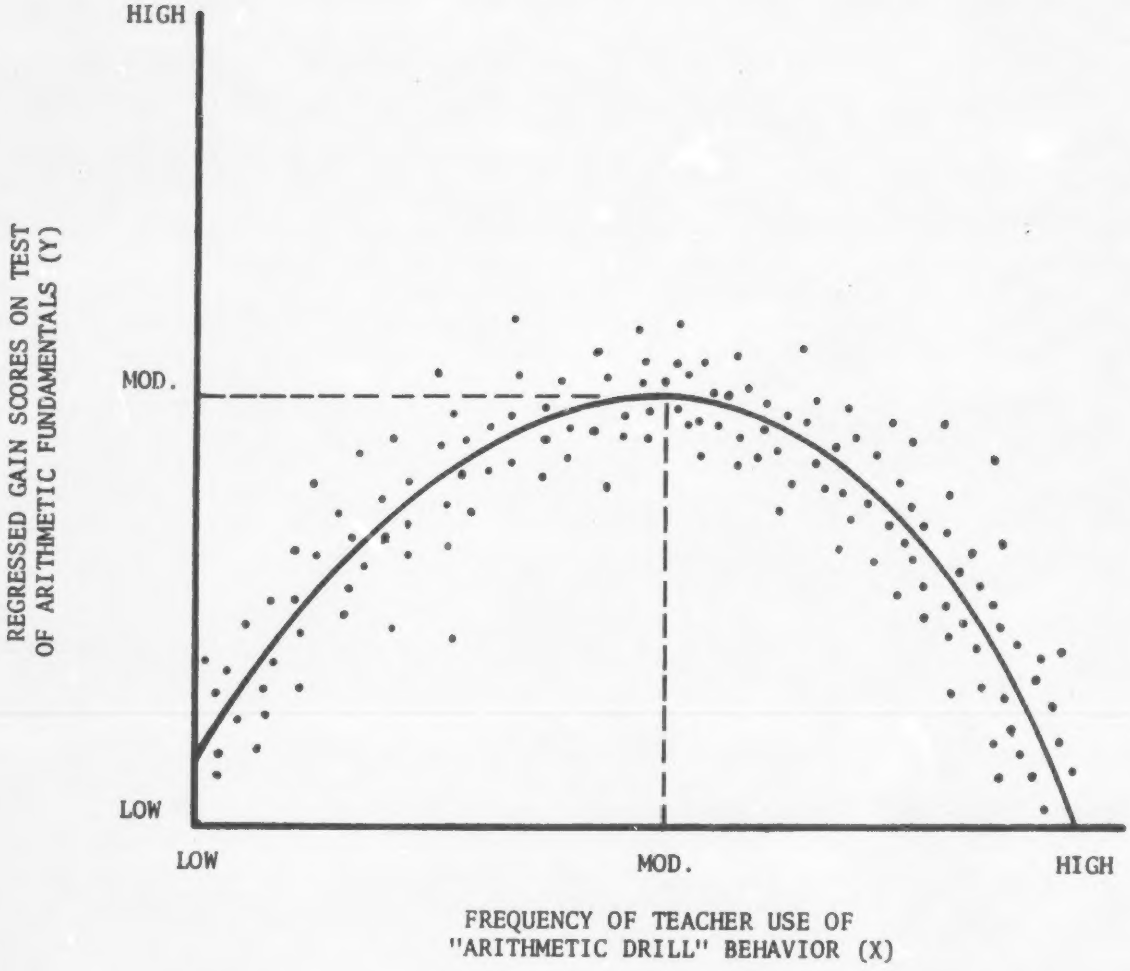


Figure 5. Hypothetical curvilinear function for teacher drill behaviors during mathematics lessons and gain scores of EMR pupils in arithmetic fundamentals. If the assumption of linearity were not tested the zero order correlation would reveal $r \approx 0$, thus obscuring an important relationship.

> The form of most of the interesting curvilinear relationships can be identified, and may help in determining optimal levels of teaching behaviors with handicapped learners.

Multidimensional Scaling. Multidimensional scaling (MDS) is a comparatively new multivariate technique which has been successfully applied in psychological and marketing research but has yet to be widely used in educational inquiry (Romney, Shepard, and Nerlove, 1972a; 1972b). The technique may be particularly useful for CBTE programs as it provides a method of differentiating teachers along a number of performance dimensions.

The method utilizes rank order data, and by obtaining rank order measurements about teacher's specific competencies one can locate a given teacher in relation to an "ideal vector" and in relationship to other teachers being ranked. The method also provides differential weights for respective teaching dimensions. Instead of using only one source of measures, rankings of teachers may be obtained from a variety of sources (e.g., direct observation, peer assessments, supervisor ratings, pupil opinions, paper and pencil tests, etc). This provides information on what competencies, and what uniquely weighted combination of competencies different sources expect in a teacher.

The following hypothetical examples shows how MDS may be of use in evaluation of teacher competencies.

Judges (supervisors, etc.) who have observed teachers are asked to rank them on any number of relevant competencies, e.g., tolerance of deviant behavior (dimension I), amount of time on task (dimension II). The relevant dimensions are selected as a test of the competencies stipulated by the CBTE program. MDS not only represents the teachers performance, it locates the performance in relation to an ideal vector which has been determined by the "weight" assigned to the unique combination of dimensions

I and II. Two different "ideal" vectors are shown in Figure 6.

Depending upon determination of the ideal vector, we can rank order the teachers on the basis of projection on the ideal vector. If vector 1 is ideal, the rank order is $T_3 < T_2 < T_1 < T_4$, and if vector 2 is ideal the rank order is $T_3 < T_1 < T_2 < T_4$. By the representation of teachers on relevant CBTE dimensions and the ideal vector, we are able to not only validate the CBTE attributes, but also to find the "ideal" combination of the attributes. Another variation is to use Coomb's technique of locating an ideal point (as opposed to vector). The teachers who are closer to the ideal point are the most competent teachers.

In an alternative use of MDS, we can obtain rankings which discriminate between good and bad teachers. The good teachers will cluster together and will be closer to the ideal point, or will have more projection on the ideal vector. This would help us to identify those who did not reach CBTE criteria even though the "bad" teachers' scores on all the competencies may look good. This is a consequence of the location of the ideal vector or ideal point which gives differential weights to different dimensions.

The technique holds great promise for practical application to the major problem facing CBTE programs, namely, identification and verification of competencies.

> Recommendation 16.00. Researchers of CBTE in special education should be encouraged to explore the merits and utility ofMDS techniques.

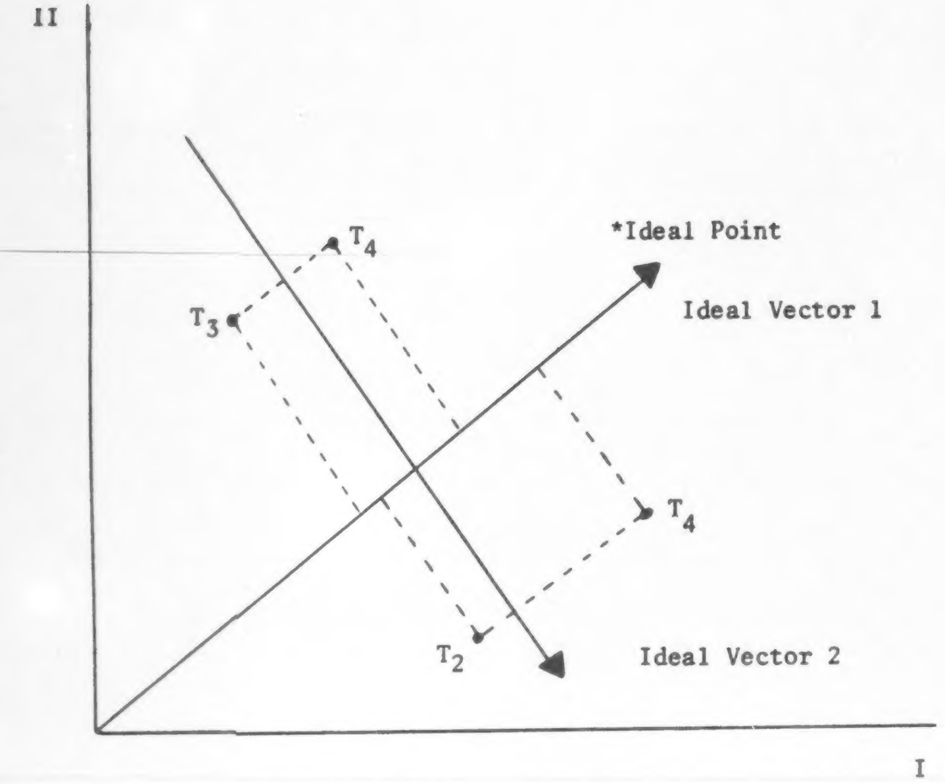

II
I
*Ideal Point
Ideal Vector 1
Ideal Vector 2
T_4
T_3
T_4
T_2

Figure 6. Multidimensional scaling of two teacher behavior dimensions in relation to "ideal" vectors.

Summary

In this section we have attempted to deal with issues pertinent to the question: How can CBTE programs determine which competencies to select for training teachers of handicapped children? We have argued that teaching competencies must be validated against criteria relating directly to the growth of handicapped pupils in relevant curriculum areas. A preferred method for building an empirical base for competencies to be included in training programs should be built through teacher behavior research efforts. The role of theory is particularly stressed for the purpose of guiding research efforts toward an integrated and coordinated set of relevant teaching behaviors for study. The fragmented nature of extant research findings relative to teacher behavior variables and their effects on the growth of handicapped pupils strongly suggests the need for further conceptual work in this area.

We have argued for greater support for programmatic and longitudinal research on teacher behavior effects. While programmatic research deserves particular support we have suggested the need to review current sponsor policies and practices toward encouraging and fostering the development of increased programmatic efforts by researchers in special education. It was also suggested that individual projects of smaller scale and shorter duration should be encouraged and supported to the extent that the cummulative outcomes of independent individual project efforts can be integrated within the context of a comprehensive planning effort. We reiterate our belief that funding sources should establish independent criteria for supporting programatic and individual project research, respectively.

Our review of the research literature revealed a serious lack of methodological rigor in most of the studies reviewed, the general dearth of programmatic research not withstanding. We see a particular need for the development of instrumentation specifically designed to measure the growth of handicapped pupils in areas relevant to curriculum objectives. Particular effort should go into the development of criterion referenced measures and observation systems. There is clearly a need to develop reliable, valid, and sensitive indexes of growth of handicapped pupils in both academic and non-academic areas.

When considering the most fruitful approaches to the study of teacher behavior effects, we have attempted to prioritize research paradigms for potential support. Highest priority should be afforded to those studies which attempt to relate presage to process to product variables involving both teacher and pupil variables. Our second priority would be the support of process-product studies; and also to support process occurrence studies. We see relatively little advantage to encouraging presage-product investigations since relatively little can be learned that will assist in uncovering teacher competencies from these paradigms. The principle of studying "proximal" blocks of variables has been emphasized as an important criterion in attempting to determine highest potential "pay-off" from research efforts. We contend that the more proximal the independent variables are to the criterion variable, the greater is the probability of validating meaningful relationships. Therefore, relating teacher background variables (e.g., years of experience, personality characteristics, values, etc.) directly to pupil outcomes is not likely to produce interesting results. Such presage variables are undoubtedly mediated through the teacher process variables to impact on the pupil's behavior and growth.

Several overall strategies for studying teaching effects were discussed with particular reference to correlational and experimental approaches. We suggested the adoption of a strategy which the first seeks to uncover relationships between pupil growth criteria and specified teacher behaviors in field settings. The strategy calls for the identification of teachers who are associated with the highest and lowest residualized gain scores in an attempt to uncover the process behaviors that differentiate the two groups. Following the establishment of such relationships, these hypotheses can be tested either through replication or experimentation. To establish a functional relationship between independent and dependent variables we suggest moving into the controlled laboratory environment with rigorous experimental paradigms. The principle strategy espoused here is that hypotheses should be generated in the field through descriptive-correlational field studies and then brought to the laboratory for rigorous experimental validation.

When considering which variables should be studied, we contend that the rather popular search for relevant generic skills by regular education researchers has not been particularly profitable. Hence, we propose that researchers in special education focus on specific competencies of teachers in relationship to the content taught, the nature of the pupils taught, and the context of specific administrative arrangements. A particularly important need is for the development of programmatic efforts to study teacher decision making strategies--that is the conditions under which teachers choose to emit behaviors within their repertories.

Finally, we have attempted to briefly indicate how the techniques of multivariable analysis (e.g., regression analysis, path analysis, multidimensional scaling) can profitably be used by researchers who must use nonexperimental research paradigms in the field of special education. We concluded the section with the important caveat that researchers studying the effects of teacher behavior on pupil growth must be sensitive to the fact that many of the relationships sought may be non-linear in nature. It is important that researchers test the assumption of linearity or risk obscuring critical curvilinear relationships through the statistical procedures used.

We submit that if the recommendations put foreard in this section are accepted by funding agencies and special education researchers then there is every reason to believe that reliable and validated teacher performance variables can be identified and translated into competency objectives by training personnel responsible for CBTE in special education. However, we hasten to remind the reader of still two more very important caveats: First, this section simply attempts to deal with issues related to securing an empirical base for CBTE through teacher behavior research. The writers neither suggest that CBTE is the most appropriate means for preparing personnel to teach the handicapped, nor do they contend that the competencies needed by teachers of the handicapped necessarily differ from those needed to teach the non-handicapped. These issues are, themselves, viable and important empirical questions for further study. Second, it should be remembered that while we emphasize the role of teaching and its effects on pupil growth in this review, we are aware that only a relatively small percentage of the variance in pupil growth can most likely be attributed to teaching variables given the existance of a number of very powerful organismic and environmental variables which affect handicapped pupils. The ability to manipulate these variables lie beyond the resources of teachers and the schools. But regardless of the magnitude of its contribution to the growth of handicapped pupils, teaching is the business of professional educators who must seek to optimize its effects on the handicapped.

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CHAPTER V

DISCUSSION AND RECOMMENDATIONS: TEACHER TRAINING RESEARCH AND CBTE

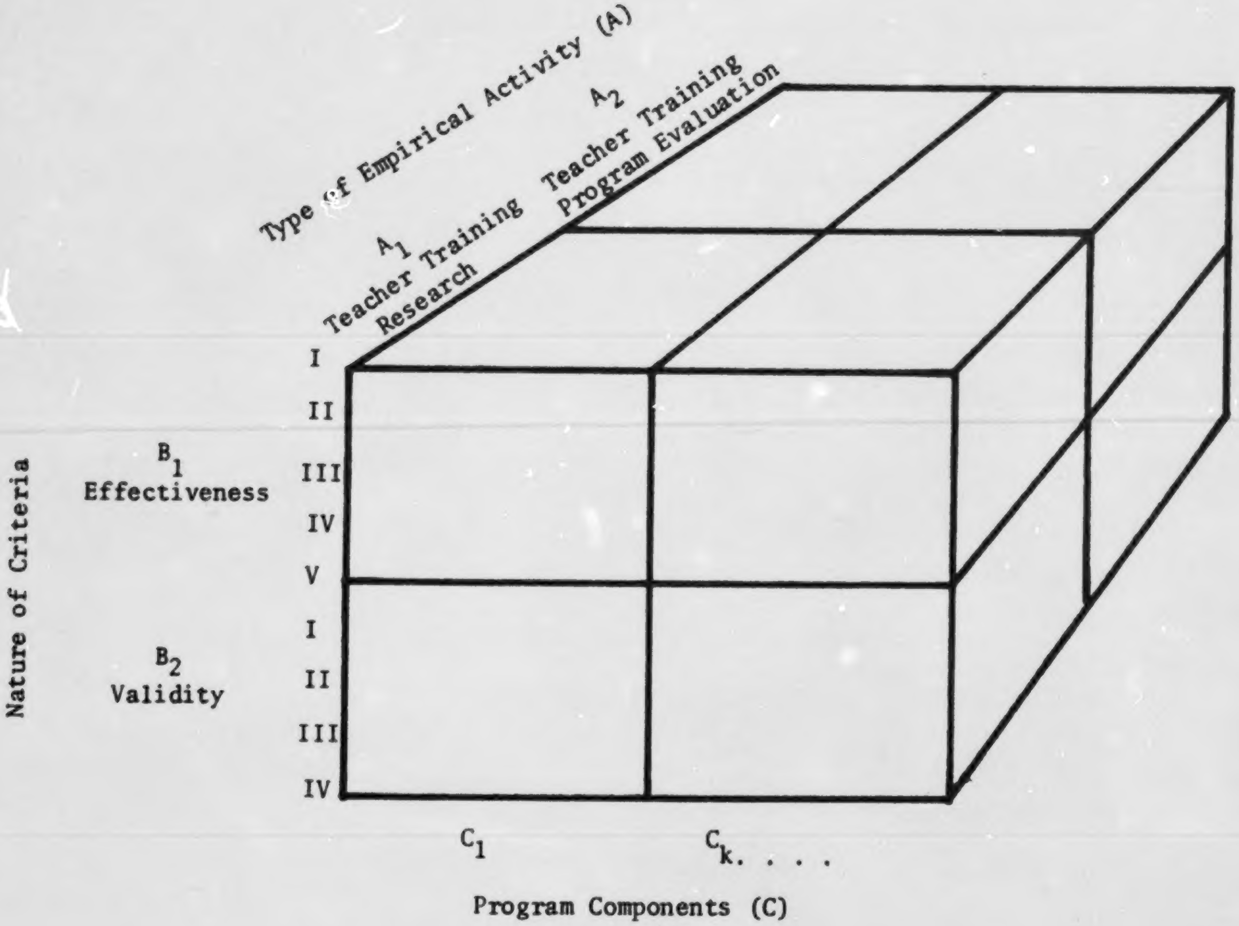
In Chapter III a number of special education teacher training programs were reviewed from the perspective of published CBTE criteria. It became apparent that, to the extent that our sample can be viewed as representative of CBTE in special education, most programs (61%) rely primarily on authoritative sources for the basis of competency selection. Only five programs of a total of eighteen (27%) reviewed were classified as having utilized empirical techniques for determining which competencies would be included in their programs. However, fourteen of the eighteen programs reviewed (78%) have specified their behavioral objectives, while seventeen of the eighteen (94%) publicly reported the teaching competencies they intended to train. In other words in the absence of support from empirical research on teacher behavior effects, trainers are none the less proceeding to identify and publicly state the competencies which their trainees must acquire to teach handicapped pupils in the schools. Hence, it is clear that teacher training programs in special education must assume a major portion of the burden for providing evidence for the validity and effectiveness of their programs. This section will deal with some of the more salient issues related to methodological, conceptual, and substantive needs for research and evaluation of CBTE programs and program components.

Conceptual Model for Empirical Activity in Teacher Education

Figure 7 offers a conceptual framework within which we have chosen to classify and discuss issues related to inquiry in the field of teacher training in special education. The model is presented only for convenience in communication.

The model in Figure 7 suggests that for any particular criterion behavior, cluster, or composite of objectives it is necessary to differentiate two different types of inquiry in teacher training (A). Further, the model focuses on differentiating classes of data for the purpose of inferring levels of training effectiveness and/or validity (B). Finally, the third dimension focuses our attention on the aggregate of training components which define a training program (C). Facet A consists of inquiry activities which logically are subsumed under Teacher Training Research (A_1) and those activities which fall under Teacher Training Evaluation (A_2). Facet B distinguishes between data which permit inferences relative to levels (I - V) of the Effectiveness of Training (B_1) and a second class of evidence leading to inferences pertaining to levels (I - IV) of the Validity of Training (B_2). Facet C consists of N_k variables which are definable as logical components of Teacher Training ($C_{1} \ldots C_{k}$). We turn now to defining each of these facets through differentiating the salient characteristics of their subordinates.

Differentiating Research and Evaluation in Teacher Training (A). When we refer to teacher training research (TTR) we are defining a set of empirical activities which have as a major purpose the identification of methods and principles for realizing a relatively permanent change in the behavior, attitudes, and/or knowledge of those who will or are teaching handicapped pupils. Central to the concept is concern for generalization of the results of inquiry in teacher training toward building an empirically developed instructional science of training teachers of the handicapped. Hence, all of the methodological criteria applied to scientific inquiry are appropriate when designing TTR activities. To make generalization possible particular emphasis must be placed on controlling sources of external


Type of Empirical Activity (A)
A_1
Teacher Training Research
A_2
Teacher Training Program Evaluation
Nature of Criteria
B_1
Effectiveness
I
II
III
IV
V
B_2
Validity
I
II
III
IV
C_1
C_k. . . .
Program Components (C)

A_1 - Effectiveness and validity of results generalizable to a population of Teacher Training Programs.

A_2 - Evidence for efficacy and validity of a single Program.

B_1 - Effectiveness evidence for total Program drawn from research and evaluation efforts.

B_2 - Validity evidence for total Program drawn from research and evaluation efforts.

C_k - Effectiveness and validity data for specific program component drawn from both research and evaluation activities.

B_1 (I-V) - Levels of effectiveness.

B_2 (I-IV) - Levels of validity.

Figure 7. Conceptual model of empirical activity in teacher education.

invalidity of data. Internal validity of research is necessary but not sufficient if the results cannot be generalized to a known population, situations, treatment and measurement variables (Campbell & Stanley, 1963).

Teacher training evaluation (TTE) activities relate to the gathering of evidence about training procedures, organizational variables, roles and functions, etc., which permit assessment of both formative (current) and summative progress toward meeting stipulated or implicit goals and objectives. The evaluator's primary concern is to collect objective data which will assist in making relatively rapid policy decisions resulting in adapting, adopting, rejecting the components of a training program, or the program considered as a whole. While TTE efforts may utilize the methods of scientific inquiry, generalization of results to other programs is rarely possible because such TTE efforts tend to focus on controlling internal invalidity in data collection procedures. TTE is not generally intended to contribute to an instructional science of teacher training.

Differentiating Effectiveness and Validity of Teacher Training (B). Effectiveness of teacher training refers to the gathering of objective evidence. That is, as a function of one or more operationally defined training variables, the behavior of teacher-trainees undergoes a relatively permanent change, a change to a pre-specified level and/or quality which can be demonstrated to have transferred in naturalistic contexts to some aspect(s) of teaching handicapped pupils. The two most salient characteristics of the concept of training effectiveness are: objective evidence of change among trainees in desired directions and levels as a function of definable and replicable training variables, and the demonstration that such change transfers to work situations with handicapped pupils. The concept of effectiveness does not imply the necessity for gathering evidence pertinent to the growth of handicapped learners as a function of teaching; rather it requires the gathering of evidence of the growth of trainees as a function of teacher training. The assertion of a training program's effectiveness is based on the assumption that trainees achieve demonstrable predefined competencies and behaviors the program intends as a result of program activities.

The concept of validity applied to teacher training subsumes all of the defining elements to meet the criteria for effectiveness. It adds the requirement that the competencies developed among trainees as a function of training have direct influence on the growth of handicapped pupils. In other words, teacher training is ultimately validated, if skills and behaviors acquired during training have a direct or indirect effect on pupil growth.

It will be noted by the reader that our use of the concept of validity differs somewhat from traditional psychometric usage. For the purpose of clarity, we point out that when a program can demonstrate that its training achieves desired results consistently, it is an _effective_ program (it produces reliable and valid outcomes). When a program can demonstrate effective training procedures resulting in desired trainee outcomes and where such outcomes also are shown to have influence on the growth of handicapped children, it is a _valid_ training program. Hence, the concept of validity as used in the present context refers specifically to the _raison d'etre_ for selection of teacher competencies to be trained and not the methods of teacher training themselves.

It is apparent that the validity of a training program as defined in the present context can be assessed without gathering effectiveness evidence. For example, a particular training program can stipulate its objectives in behavioral terms, establish a training program designed to meet those objectives, follow-up graduates of the program and demonstrate that those who reveal criterion behaviors have significant impact on the growth of handicapped pupils while those who do not reveal criterion behaviors have little or no impact on pupil outcomes. Evidence is thus gathered in support of the competencies stressed by the program. However, a more complete assessment of validation for the program would ask the question: What percentage of the sample demonstrated the criterion behaviors prior to training, after training, and in direct teaching with handicapped children? Obviously the program cannot be credited with effects of training if trainees possessed criterion behaviors prior to entry into the program.

Levels of Effectiveness and Validity. Turner (1972) and others have proposed schemas for conceptualizing different levels of validation. We have modified these conceptualizations by emphasizing the importance of differentiating between the concepts of "effectiveness" and "validity." However, it is obvious that we are dealing with a continum of levels or stages within each concept. Table 10 offers the reader our preliminary view of how the stages of effectiveness and validity criteria might be ordered and defined.

Differentiating Program Components and Total Training Programs (C). Teacher training in special education is a complex multi-faceted set of organizational, contextual, situational, procedural, and inter-personal variables interacting in both controlled and uncontrolled ways. These variables produce experiences and environments for trainees which are intended to result in trainee readiness for teaching handicapped children. We refer to the aggregate of experiences in a specified program as a total teacher training program.

TABLE 10

Stages of Effectiveness and Validation Criteria

	STAGES	CRITERIA
I	Effectiveness (Conceptualizing Goals and Defining Objectives)	Competencies stated in behavioral terms; the program's "philosophical" or "theoretical" orientation is publicly identified; competencies are organized in accordance with their implementation with specific handicapped pupil populations, educational contexts, and teacher roles.
II	Effectiveness (Defining Training; Assessing Entry Levels, and Stating Criterion Levels)	Training variables are identified through the stipulation of program components and contexts; trainer roles, materials and procedures are clearly evidenced; trainee entry level and outcome assessment procedures correspond to competency objectives; performance measures and criterion levels are public and explicit.
III	Effectiveness (Certifying Intended Training Variables)	Correlation of stated program philosophy and/or theoretical orientation with training variables--Is the program doing what it intended to do?
IV	Effectiveness (Relating Training to Criterion Behaviors)	Evidence that replicable training variables and contexts result in achievement of criterion performance indicative of competency acquisition.
V	Effectiveness (Demonstrating Transfer of Training)	Trained competencies are transferred to naturalistic contexts and roles with handicapped pupils.
I	Validation (Relating Competencies to Educational Processes)	Observed teacher performance is related to pre-stipulated contingent processes valued in the education of handicapped children (e.g., desirable pupil behaviors).
II	Validation (Relating Competencies to Pupil Outcomes)	Observed teacher performance is related to valued pupil growth in specified curriculum areas.
III	Validation (Relating Teacher Competence to Comprehensive Pupil Growth)	Observed teacher performance is related to a composite of pupil growth variables constituting a comprehensive index of objectives for the education of handicapped pupils.
IV	Validation (Relating Teacher Effects to Adult Adjustment)	Observed teacher performance related to adult adjustment of handicapped pupils.

The advent of CBTE has provided a useful way of looking at programs in terms of components having definable characteristics which can be scaled and measured. Our analysis of CBTE programs in Chapter III is one example of a components analysis of eighteen CBTE oriented programs. In addition to the criteria provided by the literature on CBTE, most contemporary teacher training programs have many similar program components (e.g., introductory courses pre-student teaching practicum, student teaching, inservice workshops, etc.). Components of teacher training programs can be relatively comprehensive and general in terms of a total training effort (e.g., practica) or highly prescribed and limited in terms of the totality (e.g., a visit to a diagnostic clinic, a workshop given by a particular national figure, a particular multi-media module).

It is obvious that when interest is in total programs and their effects, it is necessary to define the totality in terms of some set of program components if any modicum of clarity and utility is to be achieved. The greater the specificity of components the higher is the probability of gathering evidence on total program effects. Differentiation among program components is an ideal that is worthy of pursuit but impossible to achieve. Defining program elements in molecular terms may result in clarity but not necessarily in utility. Hence, program components must be defined in terms of the smallest meaningful elements for teacher education. No criteria currently exist for making such decision but it seems safe to suggest that we parse programs into components which permit sufficient operational clarity to allow replication and sufficient utility to be of particular interest to teacher educators.

Major Issues in Teacher Training Research

As might be expected from previous chapters, very little can be generalized from the current state of knowledge about the effectiveness of teacher training procedures in special education. Our review does, however, suggest a few promising techniques which do have empirical support when applied to a constructed set of teacher competencies. For example, the use of behavior modification techniques, cybernetic feedback models, and modeling have received some attention with reasonably favorable results. However, we believe that in the great majority of the research reviewed very little attention is given to the question: What are the most effective procedures and conditions for maximizing trainee acquisition of specified competencies? In fact, researchers have not, to our knowledge, asked the more basic question: Do special education teacher education programs have a unique effect on the teaching behavior of trainees? Hence, we have a fertile area for expanded research activity. When we consider the vast sums and human resources being invested in specialized training of teachers to work with handicapped pupils, it is incomprehensible that so little data exists relative to the effects of such training on the skill, knowledge, and attitude development of trainees. There is clearly a need for extensive support of programmatic and project research related to basic and applied issues in the training of teachers of the handicapped. We will consider some of the more pressing needs in this section.

Effectiveness of Teacher Training. Assuming that CBTE programs have stipulated their performance objectives, there remains the issue of determining the most effective means for achieving these objectives. Research in teacher training promises to deliver generalizable results which have direct applicability to planning and implementing CBTE programs in special education.

Hence, it would appear that inquiry of this nature should enjoy relatively high priority for support. Such research activity should be subject to the same standards of methodological rigor as was previously discussed in connection with teacher behavior research. While we maintain strong support for teacher training program evaluation (A_2) we again emphasize the importance of differentiating between TTR and TTE. Evaluation paradigms are frequently tied to non-replicable training variables which are of such limited generalizability as to severely curtail their applicability to the field of teacher training as a whole.

Teacher training research should be primarily focused on the effectiveness issue rather than upon issues of validity. We believe that the greatest potential pay-off will come from those studies which first seek to determine the effects of training on trainees (i.e., teachers) rather than those seeking direct effects on handicapped pupils. We think that given our present stage of development in research methodology, it is unlikely that a direct relationship can be established between the training received by teachers and the contribution of such training to the summative growth of the handicapped pupils. First, we must focus on the more proximal relationships between training and the performance of trainees; then between training and the formative behaviors of both trainees and their pupils; and finally on the summative growth of handicapped pupils.

Further, we submit that generalizable results of TTR are most likely to accrue from studies which focus on specific program components rather than a composite of program components. Teacher training is so complex that attempts to uncover the effects of total programs do not appear to be a particularly fruitful approach. Hence, we propose that priority in the area of TTR be given to studies which fall within the cubes A_1 B_1 C_k

(see Figure 7). It should be further pointed out that such studies must also stipulate the target population to which results are meant to generalize (e.g., teachers of partially sighted children, pre-service level, etc.).

> Recommendation 16.00. Priority should be afforded to teacher training research which focuses primarily on the effectiveness of specified training components.

Principles of Teacher Training. While we have emphasized the stipulation of specific training components in TTR, it is important to recognize that relatively few generic principles have been empirically uncovered relative to the most effective means for training teachers. There is a clear need for TTR projects which attempt to explore and uncover such principles. For example, support might be afforded to studies which seek to determine the relative importance of immediate feedback to trainees; the role of positive/negative reinforcement in the acquisition of skills; the effects of modeling teaching behaviors; the effects of gaming, simulation, and/or in situ practicums, etc. Such studies as those which explore issues of modularization vs. lock-step training, the effects of performance contracting with trainees, etc. are all examples of training variables which might produce generic principles for training teachers.

> Recommendation 17.00. Priority should be afforded to TTR studies which seek to uncover and/or explore generic principles of training teachers to work with handicapped children. Such studies should demonstrate potential for the empirical validation of important generalizations about training methods and which have promise for applicability in broad range of training programs.

The Role of Feedback. We conclude from our review that almost all teacher training efforts employ variations of cybernetic feedback models as standard procedures. Regardless of the nature of the trainee performance it is assumed that acquisition of desired behaviors is dependent on the parameters of feedback relative to the performance. However, we are just beginning to learn more about which parameters appear most effective within the feedback model (see Semmel, 1975). Given the omnibus use of feedback models and the fundamental nature of the principle when applied to teacher training it appears logical to maintain a high level of support for studies which attempt to further explicate the issue.

In essence teacher educators operate on the unverbalized, often unconcious, assumption that feedback is essential to the acquisition of teaching performance. However, one of the present authors (Semmel, 1975) has recently suggested the possibility that predictive models might be more efficient for training. For rather than offering the trainee information on what has already transpired relative to his/her teaching behavior with handicapped pupils, it may be more effective to supply the trainee with an empirically determined prediction of what will occur, given data on past experiences. Such throughput models warrant further theoretical and empirical support since they deal with issues having far reaching implications generalizable across all training efforts.

> Recommendation 18.00. Support research which seeks to systematically study the role of various parameters of feedback in conjunction with the acquisition of teaching competencies.

Theoretical Orientation of Training Programs. It is our observation that the training programs whose objectives were clear and whose methods were consistent were those that are based upon definitive theoretical approaches to pupil learning. For example, our review revealed that the Vermont Program (McKenzie, et al., 1970) clearly espouses an applied behavioral analysis orientation. The program developed at the University of Georgia (Wood, 1975) is based upon a social-developmental orientation. Each of these programs shows an internal consistency of organization which may be reasonably attributed to the definitive theoretical framework in which they were developed.

Of course, eclecticism has its place in a broadly conceptualized pre- or inservice training program. A well trained teacher probably should have a range of knowledge and skill pertaining to alternative models of teaching and learning and experience in the application of one or more of these (see Joyce & Weil, 1973). But a given training program is more likely to successfully develop teaching skills if they reflect a unified theoretical stance concerning teaching and learning. Hence, from the standpoint of presage-process-product paradigms it would appear particularly valuable to determine the relationship among theoretical program orientations, the procedures developed for training specified competencies, and trainee outcomes. We contend that whether a particular program espouses for example, a behavior modification approach, a Piagetian approach, a social-learning core curriculum, manual or oral training, etc., the statement and application of an underlying theoretical framework is as vital to the clarity of training program objectives as is the stating of specific competencies. Once again, we reiterate the importance of delimiting the conditions to which the results of such studies might be generalized by specific consideration of the curriculum content, handicapped populations, and administrative arrangements to which the variables studies are most directly applicable.

> Recommendation 19.00. Support studies which seek to determine the relationship between nature of and committment to theoretical orientations of training programs and the effectiveness of training.
>
> 19.01. How are different theoretical orientations and biases pertaining to teaching and learning reflected in the establishment, conduct and outcomes of training procedures?
>
> 19.02. Given specified objectives in the form of stated teacher competencies, which orientations produce relatively greater trainee attainment of goals?

> 19.03. Given different specified competency goals, which theoretical orientations appear to be the best "match" in realizing different objectives.
>
> 19.04. Which theoretical orientations are most appropriate for developing competencies for teaching different pupil populations and/or content.

Competency Selection and Theoretical Orientation. The absence of empirically derived performance objectives has given rise to a number of long lists of competencies drawn from various sources (e.g., Creamer & Gilmore, 1974). Competencies are frequently correlated with particular philosophical and theoretical orientations to teacher training. It appears fruitful to suggest that, given the absence of empirically determined competencies, CBTE programs first define their particular orientations or models for training and then select clusters of competencies which correspond to these orientations. The conceptual framework offered by theoretical orientations permits a logical basis for the selection of competencies. The absence of an overall framework too frequently leads to the selection of a set of unrelated teaching competencies having little apparent relationship as an aggregate to the program's objectives. We note that those CBTE programs reviewed in the present study which we evaluated to be relatively effective tended to have clearly definable orientations and evidenced the selection of competencies which related directly to their overall committments.

> Recommendation 20.00. Competencies for CBTE programs in special education should, in the absence of empirical support, be selected conceptually based upon the development and/or identification of the overall theoretical/philosophical orientations of the program.

Models of Teaching the Handicapped. Weil (1974) and Joyce & Weil (1972) have emphasized the importance of developing general models of teaching school age children. Their emphasis is clearly on the need to explore different teaching strategies which operationalize clearly definable models for teaching and then to train teachers in the use of these models through acquisition of the corresponding strategies. According to Weil, "Teaching strategies may involve hundreds of communications (moves) between teacher and student. Teaching skills, in contrast, are smaller, more discrete units of teaching, often a single teacher move; they are essentially instructional techniques and procedures that may be used in different combinations in the flow of teaching." Joyce and his associates offer four major concepts for extrapolating and defining a teaching strategy: Syntax, principles of reaction, social system, and support system. The syntax describes the sequence or phases of the teaching models--what comes first, second, third, etc. Principles of reaction refers to the expected responsiveness of teachers to learners--"rules of thumb" for the teacher relative to how she is expected to react to the learner. The social system "includes a description of student and teacher roles, hierarchical or authority relationships, and the kinds of norms that are encouraged." Finally, the support system refers to the additional environmental conditions and structure necessary for utilization of the model. Joyce & Weil (1972) have documented a large number of different models for teaching using the above constructs to attain operational definitions.

The work of Joyce and his associates has particular relevance for building more effective CBTE programs in special education. First, it would be very important to assess the already identified models for their relative promise when specifically applied to teaching specified handicapped populations under specified administrative contexts. Current practices for the education and training of handicapped pupils frequently define applicable social systems and support systems. Various models might be analyzed to determine their fit for such systems.

A second important path for inquiry is suggested by the need to determine, identify and/or develop new models for teaching which are specifically related to the handicapped pupil, his/her teacher, and the educational contexts in which s/he is educated. This approach could utilize the Joyce et al. constructs in offering operational descriptions of the teaching strategies which characterize these specific models. Subsequent to description, projects could be formulated to determine the validity of these models relative to growth of handicapped pupils.

Adopting the models for teaching the handicapped approach has the definite advantage of potentially identifying specific strategies for teaching specified groups of handicapped children, stipulating the specific performance skills necessary for each phase of each strategy, and incorporating these skills and strategies as important objectives to be attained by teacher trainees in special education CBTE programs.

> Recommendation 21.00. Support should be afforded to projects which seek to study models of teaching such as those proposed by Joyce et al. with the purpose of identifying the models which have particular promise for use in the education and training of specified handicapped populations under specified administrative contexts.
>
> 21.01. Support should be afforded to projects which seek to empirically validate the effects of specified teaching models with specified handicapped pupil populations under defined educational contexts.
>
> 21.02. Support should be afforded to projects which seek to identify, describe, and/or develop specific models for teaching handicapped populations using the constructs of (a) syntax, (b) principles of reaction, (c) social system, and (d) support system. Such projects should be required to operationally define both the strategies and the skills required for each model.
>
> 21.03. Support should be afforded to projects which seek to develop, field test, and/or validate training programs and modules which are designed to train teachers in the use of empirically and/or conceptually validated models for teaching handicapped pupils.

The Role of Curriculum and Instructional Development. Training programs should establish a balance between an emphasis upon instructional principles and generic teaching skills, and knowledge of extant child-use materials and curricula. Trainee experience with child-use materials is seen as necessary in order to provide a link between instructional principles and actual teaching. Ideally, the child-use materials employed in teacher training should be consistent with, and augment the theoretical orientation of the training program.

With the evolution of the diagnostic-prescriptive teaching model in special education, the focus of many training programs has been upon the mastery of a process of generic teaching strategies. A trainee equipped with such strategies is theoretically capable of selecting, adapting or designing instructional materials for any given child. And while such knowledge is necessary as the basis of instruction, it is insufficient to the degree that it does not deal with actual child-use curriculum materials.

Very few of the training programs reviewed in Chapter III evidenced this vertical integration of instructional theory, teacher training and child-use material. However, one program focused entirely on curriculum and instructional development (Meyen, Altman & Chandler, 1972). Since it is not usually feasible for a single program to conduct the necessary research and development required for adequate realization of all aspects of teacher preparation, the CBTE concept of modularization provides a workable alternative. Thus, encouraging continued development and dissemination of such modular training programs in curriculum, instructional development, and the topics subsumed under these categories, e.g., diagnosis, individualization, pupil evaluation, is desirable. Examples of such modular programs are the CARE (Cartwright, Cartwright, & Robine, 1972); SECTRAC (Meyen, Altman, &

Chandler, 1972), Tips for Teachers (Semmel & Thiagarajan, n.d.), and the Rutland Center A-V Training Materials (Wood, 1972).

The various instructional packages listed above could provide trainees with desirable generic skills and most are available for dissemination to training programs. Comparable products of curriculum development projects however have not been widely disseminated, and available evidence seems to suggest teacher training in the use of these materials is incidental or of marginal concern in the training process. It would seem imperative that all levels and areas of curriculum development should involve a close liaison with a training environment, so that instructional sequences can be validated in a natural context. Developers and sponsors of such projects should foster greater and more systematic dissemination of these materials to teacher education programs.

> Recommendation 22.00. Researchers and developers should be supported in efforts to develop and disseminate validated instructional packages for training teachers to understand and appropriately utilize available curriculums and programs specifically designed for use with handicapped populations.
>
> 22.01. Funded curriculum development projects should be encouraged to work cooperatively with developers for the purpose of translating curriculum content, procedures, etc. into modules and other disseminable instructional packages for use in CBTE training programs.
>
> 22.02. Sponsors should continue to support efforts to develop procedures and materials for training teachers in the competencies directly involved with instructional development.

Self-Instructional Modules. The advent of CBTE has popularized a number of training procedure alternatives having varied formats and utilizing different media. These have been comprehensively described and discussed in a previous publication (Thiagarajan, Semmel, & Semmel, 1974). Many of these approaches are predicated on principles having limited empirical support but nevertheless have considerable face validity. Individualized instruction is extended to teacher training through the use of self-instructional modules in training components. Many programs have either adapted, developed, or adopted self-instructional modules for the training of special educators. These modules have the advantage of being learner paced, highly specified with respect to competency objectives, and are frequently mediated. In addition, many modules have been field tested for their effectiveness. The modular approach component of CBTE programs is very appealing but has some potential difficulties as a generalized procedure. It would appear fruitful to support research which seeks to ascertain the effects of self-instructional modularized training procedures in comparison with other program components which attempt to develop the same competencies. One great advantage of self instructional modules from a research point of view is that they are usually well defined packages and therefore represent highly replicable independent variables provided they are found to be effective.

> Recommendation 23.00. Support teacher training research and development activities concerned with exploring the effectiveness of self-instructional modular components of training programs for teachers of the handicapped.

Simulation, Gaming and Microteaching. In recent years a number of instructional formats have been developed as alternatives to traditional teacher training methods (see Thiagarajan, Semmel, & Semmel, 1974). These new formats have potential value for CBTE in special education. Among the more promising of these techniques are the use of simulation, gaming, and microteaching. It is important that these new developments be applied to the field of special education teacher training through systematic inquiry. We should learn which formats are most applicable for training specific teacher competencies.

Recommendation 24.00. Support the systematic study of alternative formats for training teachers in the acquisition of specific skills for working with specified handicapped pupil populations.

The Effects of Different Training Environments. All training, regardless of particular characteristics, occurs within the context of a physical, social, and psychological environment. One relevant problem is the matching of specific teacher training environments to the acquisition of specific teacher competencies. CBTE emphasizes performance based training but there is little empirical evidence indicating which competencies are most effectively developed in the field component, the didactic college classroom component, self-instructional modular components, or other components. Field based training may not be the most efficient locus for developing many competencies. It should be remembered that pre-service practicums, classroom visitations, and student teaching can result in taking valuable time and energy normally devoted to the instruction of handicapped pupils. It appears necessary to determine which teaching competencies can most efficiently be developed without the necessity of competing for the resources of the public schools. Field based training program components must be researched from the broad perspective of cost/benefit analysis where the costs and benefits to trainees must be compared to possible detriments to on-going special educational programs for the handicapped--and with an eye to identifying those skills which are dependent upon development within the context of naturalistic educational settings. The broader issue of the interaction between training environments or program components and particular competency acquisition can be applied equally to that which is taught in college classes, through self-instructional, self-paced modular components of programs, etc.

Recommendation 25.00. Support research which seeks to determine the most appropriate training environments in which to develop specific teaching competencies. Studies which compare the effects of simulated and naturalistic

> environments in the development of specified competencies should yield valuable and relatively immediate implications for the modification of existing teacher training programs.

Field Training. In addition to observing that many special education teacher preparation programs lack committment to a specific learning and/or child development theory, we have also noted a lack of specificity in descriptions and conceptualization of the nature of the field experience component of the preparation program. This appears to be true of both CBTE and traditional preparation programs. For even though CBTE stipulates that trainees demonstrate competence by means of performance, probably all preparation programs provide trainees with opportunities for field experience as part of preparation to teach. In most programs, field experience takes the form of limited participation and/or classroom observation, which is then usually followed by six months to one year of student teaching.

Research on Practica and Student Teaching. Our review of programs and research has indicated that there is insufficient information on the nature of the practicum experience; e.g., how the trainees' time is spent, how much actual teaching takes place, the nature of trainee accountability, the competence of the cooperating teacher, the degree of structure in supervision, etc. One project reviewed in Chapter III focused exclusively on problems of student teaching (Strauch, 1974), while details of the practicum component were offered in several others (e.g., Universities of Florida, Indiana, N. Iowa, Vermont, Idaho). Additional research and development is needed in the development of accountability systems, observational and other evaluation instruments. Also greatly needed are methods of identifying good critic teachers, programs for evaluating and training critic teachers, and arrangements for utilization and compensation of competent cooperating teachers.

The development of standard, reliable supervisory instruments are also required, as well as development of competency requirements for practicum supervisors.

One of the most popular teacher training components used by programs in the United States is student teaching. Pre-service trainees are placed, most frequently during their senior year, with a critic teacher/class in a community school servicing the handicapped. In effect, the critic teacher serves as a model and the trainee as an apprentice. Given the omnibus use of critic teachers in student teaching it is surprising that so little empirical study has been conducted relative to important issues related to the practice. For example, it would be of considerable value to determine the relationship between the competency objectives valued or stated by the training program and the modeling teaching behavior revealed by critic teachers selected for pre service student teachers. There is so little known about the effects of student teaching and critic teachers as models on the trainees acquisition of teaching competencies in special educational contexts.

> Recommendation 26.00. Priority support should be afforded to research projects which attempt to isolate the independent effects of student teaching experiences and particularly the modeling behaviors of critic teachers on the acquisition of stipulated teaching competencies in special educational contexts.
>
> 26.01. Develop criteria for identifying competent critic teachers and conduct research on methods of evaluating and training critic teachers and practicum supervisors.

Child Service Accountability. Alternative plans for securing field placement and training practica must also be encouraged. Probably the best setting for the training of teachers is in a child service program operated in conjunction with the teacher preparation program. The Rutland (Wood, 1973), Vermont (McKenzie, et al., 1970), and Northern Iowa (Courtnage, et al., 1975) programs are all examples of training programs in which trainees are directly accountable for service to pupils (and/or parents), and are evaluated on the extent to which they meet goals for pupil behavioral change and/or learning. There can be little question that evidence of pupil growth is the best criteria for validation of the training program, and is the highest level of certification of trainee performance. Thus, training programs which establish a means of incorporating responsibility for individual pupils into their teacher training system, should be systematically studied.

Training programs that are tied to child service delivery systems appear to be inherently superior to programs where training is structurally unrelated to field services. Student teaching, participation, and observation are of limited utility if unrelated to service delivery and accountability for child growth. Although such a goal may be administratively accomplished in any number of ways, the aim of integration of preparation with practicum is in our view a central one in the improvement of teacher education.

> Recommendation 27.00. Support and encourage research and development activities on teacher preparation programs which include child service components and accountability for pupil outcomes.

Training Program and Local Education Agency (LEA) Cooperation. One of the major tenents of CBTE is the establishment of a consortium of teacher trainers, LEA's, parents and relevant citizen groups for the purpose of goal setting. Nowhere does this tenent become more important than in the practicum aspect of teacher education. A high level of mutual cooperation and a good working relationship with the LEA is imperative for effective practica. This relationship implies that everyone involved in the practicum understands and contributes to the setting of goals (e.g., child, parent, cooperating teacher, student teacher, school administration and training program. To assume that a consortia of such diversity would work cooperatively on both an administrative level and for commonly held educational goals is to deny the sociological reality of the inherently antagonistic roles in which the parties are often cast. Research and development projects concerned with improving the communication between trainers and field personnel are desirable. To this end, training programs should be held accountable for demonstrating that a plan for cooperation with field placement sites is in operation.

> Recommendation 28.00. Support research and development of methods for effecting and improving relationships between teacher preparation programs and Local Education Agencies

Delivery Systems for Inservice Training. Masters degree level programs offered by college and/or university teacher training programs and the one-shot inservice workshop are the principle delivery systems for inservice training. Considerable disenchantment with both modes has developed among inservice teachers and school administrators. CBTE offers possibilities for program variations resulting in new and potentially effective delivery systems for training inservice teachers of the handicapped. Field based masters programs are already gaining in support among special educators. Exportable, self-instructional modules are also being developed and field tested toward developing more effective training modes for inservice teacher populations. Certainly there is a need to establish high priority for the further development and evaluation of innovative delivery systems for in-service training of personnel who work with handicapped pupils in the schools.

> Recommendation 29.00. Priority support should be established for projects which attempt to develop and evaluate new delivery systems for training inservice teachers and other personnel who have responsibility for the education and training of handicapped pupils.

> 29.01. Priority support should be established for the development of modules of a self-instructional nature designed for independent delivery to in-service trainee populations in the schools. Development projects of this type should receive support only if they clearly stipulate the competencies which they propose to develop and an evaluation paradigm which permits the assessment of the effectiveness of the module. Such projects should be carefully coordinated to assure that redundancy is minimized and that their content relative to competencies selected are in accord with an acceptable criterion of assessed need.

Accountability, Evaluation and Documentation. An additional area of concern is the selection of documentation strategy that provides for collection of accountability data, for the collection of evaluation data, and for the collection of research data. Accountability data is defined here as data which is primarily descriptive, i.e., number of students trained, pupils served, percent of trainees attaining 90% on a criterion test, etc. It may also involve summaries of trainees attitudes, number of pupils taught or parents assisted. Accountability data serves to satisfy sponsoring agencies, but yields little information suitable for decision making.

Evaluation data, on the other hand, provides the program developer with information about program effectiveness such as; trainee performance on criterion tests to determine the strengths and weaknesses of instructional content; direct observation of trainee teaching skills in controlled and natural settings for identification of areas of skill remediation and programming deficiencies. Whereas evaluation data suggests areas of program revision and expansion, research data is the outcome of a test alternatives which may or may not lead program improvement. Research and research data should generalize to many training settings and issues.

It is apparent from the training programs reviewed in this study, that some programs have confused ideas about the function of the data they have collected and one finds that accountability data often is reported as evaluation data.

The most frequently reported measure of program effectiveness in the present review was the trainees' subjective evaluation of the program or some aspect of it. We believe that programs that report trainee attitude data as the measure of program evaluation, fall far short in fulfillment of the purposes for which evaluation is required--namely, verification that trainees have acquired a given set of competencies. There is a pressing need for research and development of cost effective, flexible evaluation instruments and techniques and an effort to disseminate such instruments.

> Recommendation 30.00. The development of standardized classification, terminology and program evaluation instruments has great potential for improvement of evaluation within programs, and for the conduct of comparative evaluation between programs.

The Teacher Trainer and the Researcher. Fundamental differences between the needs of training program developers and the interests of researchers have contributed to the present paucity of data on the identification of effective teaching behaviors and validated competency clusters. The multidimensional character of classroom environments and classroom interactions also cause serious measurement problems for traditional methodological alternatives.

The focus of the program developer is typically the identification and/or adaption of personnel, support, administrative and material resources to accommodate the training format. Thus, the identification of competency cluster, although a critical antecedent in CBTE program development is only one component in the total process. Since a comprehensive list of behaviorally validated competencies are not available, the program developer often generates his/her own list or resorts to the adoption of intact lists validated by professional judgments.

Because the researcher tends to focus on discrete teaching behaviors, or isolated competency clusters, the validated competencies the program developer requires are not readily available.

The program developer is typically faced with inter-relating varied knowledge and skill components over an extended period of time (e.g., one to two years), and simultaneously incorporating relevant assessment components into the sequence. This is an arduous task, which frequently requires changes in assessment formats from one subsequence to another, selection of arbitrary mastery levels, and generation of evaluation data which may be nominally satisfactory, but adds little to knowledge about effective teaching behaviors.

The researcher, on the other hand, is typically concerned with much shorter time intervals, as s/he is not under the same constraints as the teacher trainer. Continuity across research efforts, however, is frequently not possible, because funding for such research efforts are sporadic. Attempts to identify desired populations, moreover, are associated with both political and temporal constraints, which makes availability of subjects more often a chance factor than a planned or deliberate one. In addition, there is a great necessity for researchers to address problems from methodological points of view. While such research does not usually have immediate pay-off in improvement of programs, no significant advances in programming will take place without such studies.

Differences in priorities between the program developer and the teacher education researcher are tied directly to the preceding considerations. The program developer is ultimately concerned with the implementation of a total program, usually within an extant system. Thus the basis of competency selection, the specification of competencies, the selection of assessment criteria and processes all assume variable priority status depending upon the point in time in the implementation process. Changes in priority status may result from external pressures as well as input from trainee and faculty personnel.

The commitment of the teacher education researcher is often much shorter than that of the program developer and reflects an interest in the very specific relationships among presage, processes and/or product variables. Unless programmatic long-termed research is supported, there will be little data on the factors associated with long-term change in teacher behavior as it is affected by training, and similarily, long-term change in child achievement as the result of teaching.

Measures taken to promote the integration of research and training could bring much needed continuity to research in special education teacher training. Federal and state training grants are usually awarded for from one to three years, thus research within the context of such a grant, could be conducted for a similar period. Trainee and pupil populations then become available over extended periods.

Priorities in an integrated training-research program should be negotiated and formalized prior to implementation. Systematic methods for documentation and revision should also be developed prior to implementation. The presence of multiple research components would require a high level of specificity in such processes but will not restrict opportunities for revision based on relevant feedback.

It is evident however, that not all preparation programs have the interest or personnel required for the conduct an integrated research and training program. The specific competencies of researchers are not by any means identical to those of program developers. Optimally, the complimentary skills of research and program development should be available in a single teacher preparation program: perhaps with establishment of consultant resource pools, this integration will be partially realized.

Consultant resource pools could be established to assist in the identification and adaptation of extant training modules to meet unique training needs;

assist in the design of integrated training and evaluation planning activities. Casebooks could be prepared which would suggest optimal program planning and instructional sequencing schedules and/or patterns. Exemplary CBTE programs could be selected to serve as demonstration sites. R & D centers could screen available training and child use materials, and develop materials that continue to be needed by training programs. Reliable and valid observation systems, essential for the assessment of trainee performance and program validation, currently lacking in most programs, could be developed.

The resource concept reflected here in a few examples, if appropriately developed and applied, would facilitate an optimal level of dissemination, would minimize duplication of efforts, and would introduce a quality control mechanism to the process of program design. The conflicts of interest and differences in focus between the trainee and researcher in a sense permeate many of the other issues considered in this chapter. Hopefully a redefinition of the roles and responsibilities of each in terms of a cooperative undertaking, will resolve many other problems associated with training program development, implementation and evaluation.

Conclusion

The preceding numbered recommendations have suggested strategies and research topics for program development and teacher-pupil behaviors. Programs must show evidence of integration of content with field training, and must provide for trainee accountability in terms of pupil behavior. Funding and sponsorship of research on teacher behavior must be programmatic, long-term, and designed for the systematic study of each of the relevant variables associated with a given cluster of competencies. In addition, targeted competencies should be derived from a central theoretical framework so that empirical study may serve also as verification of the theory. The emphasis should be placed on quality control in research, particularly with reference to the application of rigorous standards in methodology.

In addition to the suggestions given here, the reader is referred to two recent projects aimed at generating ideas about the future conduct of educational research: the National Conference on Studies in Teaching, sponsored by the National Institute of Education (Gage, 1974), presented a series of documents detailing recommendations for future educational research. More recently, national panels on research needs related to the development of personnel to serve the handicapped was sponsored by BEH, and was conducted by Educational Testing Service (1975).

The need for careful planning in the delineation of research policy and the allocation of resources is evident. Input from researchers and teacher trainers into the policy-making processes along the lines of the NIE and ETS conferences is desirable. Additional efforts at synthesis of extant research and assessment of policy implications should be funded and conducted at regular intervals. It is further recommended that while input from constituent populations is vital and socially responsible in the decision-making process, the leadership and guidance in determination of research policy should emenenate from the most qualified, experienced professionals.

In summary, federal funds for research should be allocated on basis of a master plan which emphasizes programmic research, encourages integration of research with training program development, continues to encourage and support dissemination efforts, and takes all measures to insure that the research supported is of the highest quality in terms of methodology and documentation. For without an emphasis on professionalism and quality control, all the hopes for improved education of handicapped children can not be realized, the good will of parents, administrators, legislators and other consumer groups notwithstanding.

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